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The Journal-Lancet

A Semi-monthly Medical Journal

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VOLUME LIV

January 1934 - December 1934



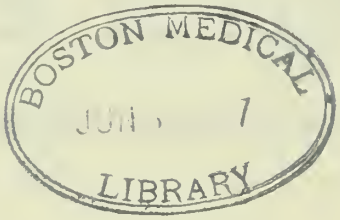
Represents the Medical Profession of
Minnesota, North Dakota, South Dakota and Montana

The Official Journal of the
North Dakota State Medical Association
South Dakota State Medical Association
Montana State Medical Association

Minnesota Academy of Medicine
Hennepin County Medical Society
Minneapolis Clinical Club
Sioux Valley Medical Association
American Students' Health Association
Great Northern Railway Surgeons' Association

Minneapolis, Minn.
Lancet Publishing Co., Publishers
1934

2795



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The JOURNAL LANCET

Minneapolis, Minnesota
January 1, 1934

New Series
Vol. LIV, No. 1

Present Epidemic of Amoebic Dysentery*

Kano Ikeda, M.D.
Saint Paul

THE first case of amœbic dysentery originating in Chicago came under our observation on October 13, first, as an outpatient for a proctoscopic examination and biopsy. A discovery of Endameba histolytica in the stool in this case on the following day, after his discharge, was purely accidental. A day after the re-admission of this patient, on October 18, the second case was brought in the hospital complaining of obscure abdominal symptoms with diarrhea, high fever, and the enlargement of the liver. A demonstration of Endameba histolytica in the first stool from this patient was a distinct surprise to the clinician. The source of infection in the first case had already been traced to Chicago. The second case had been a frequent visitor in Chicago during the summer. Thus, Chicago as a common source of infection in these two cases was resasonably evident. The significance of the incident was, at least, partly appreciated at the time, as was evidenced by my letter of October 23, notifying the State Board of Health of the diagnosis in these two cases and by the arrangement of a program on amœbiasis for our monthly staff meeting. The full significance of this experience was not realized, however, until the publication of the articles on amœbasis in the *Journal of the American Medical Association,* three weeks later.

Three additional cases were recognized within 20 days after the discovery of the first two cases, making a total of five cases of amœbic dysentery all originating in Chicago, in a period of three weeks. The press announcement of the outbreak of this disease in Chicago had not come out, at this time. Four more cases were recognized during the subsequent three weeks. A total of nine cases, all originating in Chicago and recognized within a period of less than 50 days in a private hospital of an average size, constitute the basis of this presentation.

Chicago Epidemic

Reviewing the history of the present epidemic,[1] it would seem that the Board of Health of Chicago first took cognizance of an unusual epidemiological situation in August, 1933, when "thirteen individuals who had Endameba histolytica in stools were discovered."[2] On September 1, out of the 364 food handlers, connected with a certain hotel, 26 were found to be infected with the disease, 15 active and 11 latent cases, an incidence of a little more than seven per cent, which apparently was not considered

*Presented before the Minnesota Pathological Society, December 19, 1933.

The Editors of The Journal-Lancet are pleased to present this excellent paper by Dr. Kano Ikeda on this momentous subject. A paper on the "Treatment of Amœbic Dysentery" by Dr. C. A. McKinley, Minneapolis, will appear in our next issue.

alarming. More surprising was the fact that on the second examination, concluded on October 25, 60 of those negative in the first examination were found to be infested with Endameba histolytica, as were 100 of the 498 non-food handlers. This brought up the incidence of 20 per cent among both groups. Another interesting point brought out in the investigation was a discovery of 46 carriers by the cultural method where the usual microscopic examination had failed. While the officials, apparently, did not realize the existence of a serious epidemic until early in November, they admitted, in the light of the extensive investigation covering a period of more than two preceeding months, that "There was clear evidence of an outbreak of amœbic dysentery in June, July and August, 1933"[1] and had earnestly endeavored, since September, to control it without publicity, which came through the press on November 10.

The latest report[2] from Chicago shows up to December 11, 285 cases of amœbic dysentery were reported throughout the United States outside of the city of Chicago, who apparently contracted the disease while visiting there during the summer. There have been 23 deaths. There had been, up to that date, 215 cases in Chicago proper. Twenty-three cases had been reported from New York City, nine from Detroit, nine from Washington, eight from St. Louis, eight from St. Paul, five each from Evanston, Dallas, San Francisco and Kansas City; four each from Pittsburg, Baltimore, Grand Rapids, Bloomington, and Boston, all traceable to Chicago. In addition, two cases were reported from Canada, one from Mexico and one from Paris, France. A telegraphic report from Dr. Bundeson today (December 19), reads "To date, there have been reported 540 cases of amœbic dysentery involving 165 cities with 604 carriers and 32 deaths."

Incidence in Minnesota

In Minnesota, according to the bulletin issued by the State Board of Health, 63 cases with 27 deaths were routinely reported from 1917 to 1932, inclusive, from civil practice, or an incidence of four cases a year with a 43 per cent mortality. Four hundred seventy-seven case with two deaths were reported by the Veterans Hospitals and 123 cases with three deaths by the Mayo Clinic among non-residents. Only seven cases were reported from Saint Paul from 1917 to 1927, of whom all died, and none since 1928. Only ten cases were reported from Minneapolis from 1917 to 1932, inclusive. This would seem to indicate that the physicians either fail to recognize this condition in a number of instances or neglect to report the occurrence to the health authorities when diagnosed. Contrary to the experience of investigators who claim an incidence of from 2.8 per cent to 67 per cent for this disease according to the locality, the type of individuals and groups examined and the number of examinations made per capita, my own casual routine examination of the stools submitted to the laboratory has yielded an average of only two or three positives a year for Endameba histolytica, far below one per cent of the specimens examined, during the past 15 years. Clinical amœbic dysentery had apparently been a rare disease in Minnesota until the occurrence of the present epidemic.

Up to date, 28 cases of amœbic dysentery in native Minnesotans and 26 out of state cases, have been reported to the Minnesota State Board of Health,[3] all of whom presumably contracted the disease in Chicago. These include nine native and two out of state cases from Saint Paul, eight cases from Minneapolis, three native and 24 out of state cases from Rochester, two cases from Faribault and one case each from Duluth, Bemidji, Park Rapids, Hinckley, Northfield, and Benson. Nine native and two out of state cases were diagnosed in my laboratory besides two cases under suspicion. One of the suspected cases, whose stools have been consistently negative, was a guest at the Congress Hotel in Chicago and has had the clinical symptoms of amœbic dysentery and is the mother of the last positive case (not included in this report). The other who was the husband of another positive case, died of acute peritonitis due to multiple jejunal ulcers, the exact etiology of which has not been determined. There have also been three suspected cases reported from Minneapolis.

Report of Cases

The following case reports are abstracted from my article[4] entitled "Unusual Experience with Amœbic Dysentery in an Average Hospital of a Northern State: with Report of Nine Cases Originating in Chicago" which appeared in a recent issue of the *Journal of the American Medical Association*. They are not presented in a chronological order but are grouped in various clinical forms. It may be said that all the patients made a satisfactory clinical progress and improvement and were discharged from the hospital after a stay of two to four weeks.

Group One, Ambulatory Form

The patients in this group were not particularly ill at the time of admission. They might as well

have not consulted the physician as hundreds of others who represent the latent or carrier type of this disease and constitute not only, by far, the largest group but a greater menace, epidemiologically speaking, than any other groups.

Case 9—A woman 39 years of age, was admitted to the hospital November 30, 1933, complaining of mild diarrhea with occasional mucus and gross blood the past six days. No abdominal cramps, no other complaints. The patient was in Chicago from September 8 to 11, staying at a private home and eating most of her meals at the Fair. The onset was on November 24. The incubation period was from 74 to 77 days. The patient consulted the physician after listening to a radio talk on amœbiasis.

Case 8—A woman, 30 years of age, was sent to the laboratory for stool examination on November 23, 1933. The patient was not ill but had noted an increase in the number of stools, without diarrhea or cramps, since November 3. The patient was a guest at Hotel A from October 1 to 5, 1933, and ate most of her meals at Hotel C. The incubation period was from 29 to 33 days.

Group Two, Acute Form

The patients in this group had an acute attack of abdominal cramps and were immediately hospitalized and a course of the specific therapy instituted at once, thus favoring their early and complete recovery more probable. An acute surgical condition of the abdomen may have been considered in Case 6, without the discovery of Endameba histolytica in her stools.

Case 3—A man, 45 years of age, was admitted to the hospital November 2, 1933, complaining of diarrhea and mild abdominal cramps since the day before. The temperature was 102 and the leukocyte count 22,500 on admission. The patient visited in Chicago twice in October and remembered eating a sandwich at Hotel C once, but otherwise ate at different hotels and at the Fair. The incubation period was from 15 to 17 days.

Case 6—A girl, 10 years of age, was admitted directly from the school, complaining of severe lower abdominal cramps. The temperature was normal but the leukocyte count was 15,400 with 87 per cent polymorphs. The patient was a guest at Hotel C, during September 16 to 18, and ate some of her meals there. The members of her whole family were guests at the hotel. Her father (Case 2) developed amœbic dysentery and her mother showed Endameba coli in her stools.

Group Three, Acute Form, Toxic

The patients in this group were very toxic and quite acutely ill during the first few days. The clinical picture suggested more than an ordinary uncomplicated form of the disease, although it is well known that amœbic infection may cause a severe toxic reaction on the host. Their improvement was at first slow, even after the instituting of the emetine therapy although amœbas disappeared from the stools within a few days.

Case 2—A man, 52 years of age, was admitted to the hospital, October 19, 1933, complaining of vague abdominal discomfort, diarrhea and the enlargement of the liver. The temperature was 103 and the leukocyte count 22,000. The patient was very toxic. The patient had a gastroenterostomy in 1925 for duodenal ulcer and a gastric resection, the following year. This history complicated the clinical picture. The patient had similar attacks, in a milder form, several times during the summer, the first attack occurring in July 15. Between March 23, and October 18, the patient visited in Chicago seven or eight times, staying at various hotels. The incubation period could not be definitely determined because of his frequent visits to Chicago.

Case 4—A woman, 41 years of age, was admitted to the hospital, November 7, 1933, complaining of severe abdominal cramps and watery diarrhea of three weeks duration. The patient was quite ill and toxic. The pulse rate ranged between 120 and 144 per minute at the time of admission. The temperature was 102 and the leukocyte count 19,450 with 88 per cent Neutrophils. The patient was a guest at Hotel C from September 24 to 27 and ate most of her meals at the hotel. The incubation period was from 23 to 26 days.

Group Four, Sub-acute Form

The patients in this group were admitted first on the surgical service of the hospital as rectal cases requiring biopsy. The presenting symptoms were mainly rectal although, upon further questioning, a history of repeated attacks of abdominal cramps and diarrhea with mucus and blood was elicited in each instance. Further, the presence of a palpable mass in the lower right quadrant with X-ray findings, involving the cecum and ascending colon in Case 1, was of interest. This might also have been considered a surgical condition if we had not found Endameba histolytica in his stools which was accidental.

Case 1—A man, 59 years of age, was admitted

to the hospital October 13, 1933, as an outpatient for proctoscopic examination and biopsy which was negative for malignancy. There was a small rectal ulcer which was probably traumatic in origin. He had tenesumus and pains in rectum, as of hemorrhoids. The patient also presented an ill-defined, palpable mass in the lower, right quandrant which was not tender. His temperature was 100 and the leukocyte count 6,200. He had attacks of abdominal cramps and diarrhea since September 1, 1933, while stopping at Yellowstone National Park and during his travel through the West Coast. He was forced to stop off at Saint Paul on his way home to Pennsylvania on account of the increasing rectal discomfort. The patient was a guest at Hotel C from August 16 to 24 before starting for the West. The incubation period was from seven to 14 days. A roentgen examination showed a diffuse, irregular narrowing of the cecum and ascending colon as though due to a diffuse growth or a chronic inflammation, causing the palpable mass. This gradually disappeared with improvement under the emetine therapy. (Figs. 1 and 2).

Case 5—A man, 51 years of age, was admitted to the hospital, first, October 12, 1933, because of a diffuse tumor-like growth of the rectum, for which a proctoscopic examination with biopsy was done. There was no histologic evidence of a tumor growth in the biopsied specimen. The patient had been ill with repeated attacks of severe cramps, diarrhea and tenesmus since August 15, 1933 and consulted a physician early in September. The physical examination including the roentgenograms of the colon was reported negative except an anal fissure for which suppositories were prescribed. His condition remained essentially unchanged. The patient was re-admitted on October 30, for a second biopsy. This showed a chronic inflammatory lesion. A few hours before his scheduled discharge, the first stool specimen was submitted to the laboratory which established the diagnosis. A serial section of the biopsied specimen revealed a nest of amœbas in the exudate in the rectal ulcer. (Fig. 3). The patient visited in Chicago three times during the summer, each time staying at Hotel A. The incubation period was from 53 to 57 days.

Group Five, Chronic Form

The patient in this group is an example of those who, though suffering from active manifestations of the disease, are treated as a case of a colitis, for an indefinite period. This makes a positive diagnosis extremely difficult. Endameba histolytica may well be missed in the stools ex-



FIGURE 1



FIGURE 2



FIGURE 3

cept for diligent search. The case also illustrates a remarkable improvement which may be obtained under the specific therapy in a short period of time as indicated by her clinical improvement and by the roentgenograms of her colon. Amœbic dysentery may cause chronic invalidism when not properly treated.

Case 7—A woman, 53 years of age, was admitted to the hospital November 21, because of abdominal cramps, diarrhea and weakness of many weeks standing. The patient was treated at a local hospital in the early part of August for "colitis" at which time all laboratory examinations were negative. The patient was a guest at Hotel C in Chicago from July 4 to 9, and returned there the following week stopping at Hotel H. While at this hotel, on July 18, she developed severe abdominal cramps and diarrhea and was treated by the house physician for several days. On her return home, she was unimproved and hospitalized for a week. A diagnosis of amœbic dysentery was made upon her admission to this hospital, 125 days after the onset of illness, and 119 days after the physician was consulted at home. The temperature on admission was 101 and the leukocyte count was 9,000. She was extremely weak and complained of constant abdominal discomfort and diarrhea which she had suffered since the onset of illness. The roentgenogram of the colon at this time showed an extensive involvement of the cecum, ascending portion and the transverse portion. Immediately on the institution of the specific therapy, she began to improve and in two weeks, the clinical improvement was well portrayed by the roentgenograms of the colon which showed a relaxation, flexibility and haustration of the wall entirely absent in the first examination. (Figs. 4 and 5).

(Continued in Our Next Issue)



FIGURE 4

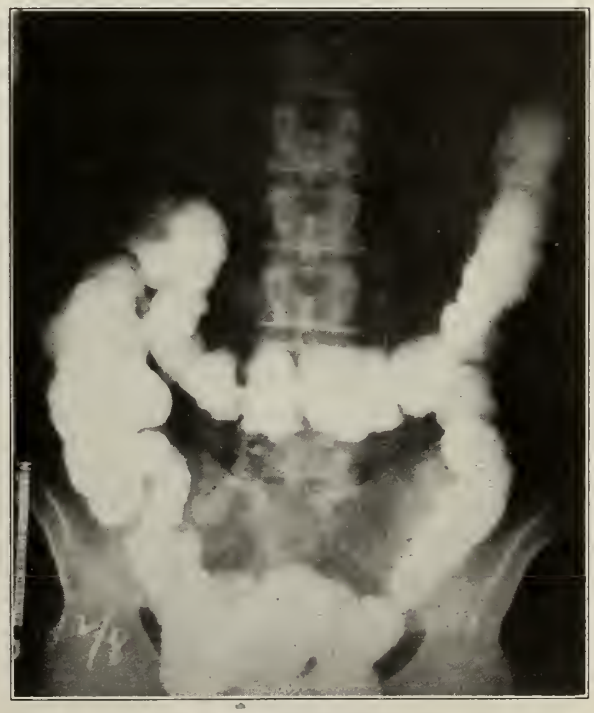


FIGURE 5

Poliomyelitis: A Review of the Literature

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ACUTE Anterior Poliomyelitis (Infantile Paralysis) is an acute systemic infectious disease which in a limited number of cases tends toward an involvement of the gray matter of the central nervous system, capable of causing widely disseminated lesions throughout the tissues of the brain and cord. The toxin produced in this disease has a special affinity for destroying the gray matter or motor tracts and seldom affects except indirectly the sensory tracts. The disease occurs spasmodically, but has strong epidemic propensities. It is of sudden onset and is a disease pre-eminently of childhood and young adults.

The great epidemics of the last decade, both in Europe and America, have given such impulse to the study of acute poliomyelitis that a multitude of facts have been discovered. These have overthrown many of the previous conceptions of the malady. Formerly, acutely appearing paralysis was the chief consideration and was supposed to represent the whole expression of the disease. Now, thanks to the extensive epidemiological and clinical studies, we have come to realize that cases with paralysis form but a small percentage of the total incidence. The circumstance that 70 or 80 per cent, or possibly even a higher count during epidemics, present merely the aspect of an acute, generalized infection, without signs of central nervous system injury, not only renders the diagnosis of individual cases difficult, but also complicates the correct elucidation of epidemiological phenomena. There is ample evidence now at hand, both from experimental laboratory and clinic, to establish, beyond peradventure, the fact that this remarkable disease is primarily a systemic infection, and fortunately in a small number only, does the virus pass through and into the nervous tissues with disastrous, paralyzing effect.

The disease is ancient, and was probably first described with any degree of accuracy by the English physician Underwood in 1774. The first systematic study of a large group of cases which finally established the disease as a clinical entity was published by Jacob von Heine in 1840 in Kolmar, Germany. He undoubtedly recognized that there was a febrile period preceding the onset of paralysis. Since Heine's time there have been many contributions to the literature, notably by Strümpel, Medin in Sweden, whose name is often associated with that of Heine, Wickman, Flexner, Amoss, and others. The first successful transfer of the disease to monkeys was accomplished by Landsteiner and Popper in Vienna in 1909, and in the same year Flexner and Lewis succeeded in establishing the disease definitely in the monkey and in carrying it from generation to generation. Very shortly after this the virus was shown to be filterable. In 1914 Flexner and Noguchi reported experiments on the isolation and cultivation of an organism which seemed always to be associated with the disease. The etiologic role of this organism has not yet been broadly confirmed or discredited by other observers. Rosenow has also reported the presence of a form of streptococcus which he believes to be the etiologic agent of the disease.

Epidemiology

After the first output of experimental work on poliomyelitis, interest seemed to wane until it was again aroused by the occurrence of fresh epidemics throughout the world. According to the 1930 report of the League of Nations the most important epidemics of poliomyelitis since 1924 have been in England in 1926 to 1927, with 2,191 cases and 255 deaths; in Germany in 1926, especially in Saxony, with 587 cases and ten deaths; Roumania in 1927, lasting until 1929, with 2,635 cases and 300 deaths; in the United States in 1926 and 1927, when 10,151 cases were reported, with a fatality rate of 21 per cent, California, Massachusetts and Ohio suffering the most; in different Canadian provinces in 1927, 1928 and 1929; New Zealand in 1925 with 1,319 cases and a mortality of 13.1 per cent, and in Ireland in 1924, with 463 cases and 89 deaths.

Poliomyelitis is a disease mainly of the temperate or colder climates and becomes less prevalent nearer the equator. At the same time it also has a seasonal variation, being more prevalent during the summer and autumn than in winter or spring, although sporadic cases are occassionally reported for the latter seasons. Aycock has shown that the age distribution of poliomyelitis corresponds to that for measles and for diphtheria; that there is a greater preponderance of

cases in the younger age groups in urban than in rural communities for all these diseases, and that the case incidence in the various age groups is directly proportional to the concentration of the population.

Since it is evident that in epidemics the disease is irregular in its attacks upon individuals it is, therefore, quite probable that a widespread immunization, especially in urban districts, must occur early in life either due to subinfective doses or to an abortive attack of the disease.

Method of Propagation

It has been generally accepted that, as shown by Flexner and his associates, the intranasal route is the usual one for infection with poliomyelitis virus. Recently, however, several men have implicated the intestinal tract as another source of entrance.

Aycock reports that the virus may be transmitted occassionally through milk. This opinion is based on the results of studies on two American epidemics and one at Broadstairs, England. However, Aycock does not believe that the virus is taken in through the digestive tract itself, but rather that it is absorbed by contact with the nasopharyngeal mucosa. A common source is, therefore, suggested. While most people implicate a healthy carrier as this source, yet there is also a possibility that milk or even water may play some role.

Course and Prognosis

The incubation period is from two to fourteen days. A fair average is probably about seven days. One attack gives almost complete immunity. Many cases belong to the so-called abortive type; that is, no localizing in the central nervous system occurs. It is impossible to determine the percentage of this group; some place the number as high as 50 per cent, but others claim that the number following this course is negligible. Those cases that do go on to the development of paralysis present the widest variety in the structures involved and in the extent of the damage. This depends, of course, upon the localization of the involvement in the central nervous system and the extent to which the destructive process proceeds. The immediate cause of death is usually paralysis of the muscles of respiration or some intercurrent disease, particularly pneumonia. The mortality is considerably higher among adults.

The prognosis as to recovery from paralysis has not been worked out with the care that might be expected in a problem of such importance. A fairly good percentage of the cases go on to complete recovery. Many recover perfect functional use of the limbs involved, but show a slight difference in the size of these as compared with the corresponding normal members. In many cases there is practically no improvement. In some epidemics the outlook is much more favorable than in others.

Symptoms and Diagnosis

If during the course of an epidemic every case of illness, particularly in children, is regarded with suspicion and is subjected to an intensive investigation, therefore, an early diagnosis should be the rule. When the epidemic is not in progress, it is unusual for a diagnosis to be made before paralysis has developed.

Most of the cases have very slight general symptoms and frequently escape notice. In about five per cent of the cases, paralysis develops; in the other 95 per cent fever always occurs and is the most constantly found symptom. It usually is low, but may be high. Headache is the next most common symptom and is found in practically all cases where the patient is old enough to describe the sensation. Constipation is the rule but diarrhea has occurred in some epidemics. Pain, tenderness and muscle soreness are nearly always present. Stiff neck occurs in 40 per cent of the cases. In many instances the patient looks very much sicker than the temperature and pulse would indicate. Sweating is very common. A valuable sign is the fading of color in the eyes, with oftimes a glassy appearance. A decided tendency to restlessness, irritability, and a general state of excitement. Peabody has particularly called attention to the tendency for these patients to complain and to resent being disturbed or moved. This is probably due to the hyperesthesia which results in pain when the patient is handled. Tremors and twitching of the muscles somewhere is often observed. Convulsions occur in babies. Delirium occurs at times, but is generally of short duration. Reflexes are disturbed or absent when the toxin begins or has reached the central nervous system.

However, one does not have to be a neurologist to make the type of examination that leads to a diagnosis of early poliomyelitis. The presence of a coarse tremor when the patient moves or is moved has frequently been mentioned by the individual or by a member of the family. Draper and Aycock have called this the "ataxic tremor." Draper puts it in the stage of the disease where the virus is passing from the general systemic infection period to the central nervous system period. Soreness or distress in the back on anterior bending of the body is usually character-

istically present. Draper has called this the "spine sign" and considers it due to irritation particularly around the ganglia. Three cases are recalled by the author where the discomfort was noticed when the patient sat up in bed for lung examination led, in connection with other findings, to diagnosis of poliomyelitis. Kernig's sign may or may not be present at this time.

Spinal puncture with examination of the fluid is a very needful diagnostic procedure in the early course of the disease. There is a phase very early, probably earlier than most cases are seen, when the fluid is negative. When signs of irritation of the central nervous system are present the fluid has become positive. The spinal fluid findings are as follows: *Appearance*—clear to faint ground glass and rarely turbid (depending on number of cells); *Cells*—50-2,000; average 150-300. A pleocytosis of fifty per cent multilobed cells on the first day changing rapidly to a ninety per cent mononucleosis is pathognomonic. The cell count must be made at the bedside as cytolysis of the cells rapidly occurs; *Globulin*—considerably increased: *Pressure*—elevated at first: *Sugar*—Benedict's solution gives a normal reduction; *Culture*—sterile. "The Welsbach Mantle," so characteristic of the fluid in tuberculosis meningitis is usually absent. The cerebrospinal fluid is normal in the abortive cases and during the first febrile disturbance of the dromedary type. There is usually a leucocytosis of 15,000 to 30,000.

As to *differential diagnosis* the following leads have proved helpful: First and foremost is the impression that we see of an individual who is sick, sick out of proportion to what one would anticipate from the history. The prostration seems more than one would have reason to expect. Second, the general physicial examination of the parts where one usually notes findings is essentially negative. There is not enough in the throat to account for the malaise, the headache, the gastro-intestinal disturbance. Nor are the findings in the chest and abdomen sufficient. The general lymph node enlargement which Burrows has recently stressed has been found though not constantly in all cases. Third, the examination of the nervous system does show evidences of irritability.

The Status of Serum Therapy

Following the recognition of the preparalytic stage of poliomyelitis, treatment has been directed towards the prevention of paralysis by finding a means to arrest the disease before the spinal cord is involved. *The early administration of convalescent serum* is by far the most important therapeutic measure known at this time. Campbell and Mirsky sum up our present knowledge of poliomyelitis therapy as follows:

Flexner and Amos demonstrated the presence of hexamine in the spinal fluid of monkeys after oral administration, but its therapeutic value was found wanting in such an alkaline fluid.

Rosenow, claiming that a streptococcus is the cause of poliomyelitis, has made a serum and brings experimental and clinical evidence as to its value. His experimental results, however, have not been corroborated by other observers, and the clinical evidence lacks convincing argument.

The use of convalescent serum is based on the conclusive experiments of Flexner and his associates which demonstrate that the potent virus of poliomyelitis is rendered innocuous when mixed with convalescent serum, and that administration of the serum, as late as twenty-four hours after the monkey has been inoculated with the virus, will prevent the development of paralysis. The value of convalescent serum in human beings, however, is difficult to establish since no one can foretell in the preparalytic stage which case will go on to paralysis, and which will not. Knowing the tragic consequences of the disease, it is impossible to treat only alternate cases for purposes of control.

Furthermore, the great variability of the severity of the disease in different epidemics and in the same epidemic renders comparison of results of treatment unsatisfactory. Ayer, in a series of 126 cases, found the serum of definite value in the preparalytic stage. The Research Committee in Manitoba, reporting on 169 cases, came to similar conclusions.

Perhaps the most convincing evidence in favor of convalescent serum is the report of Aycock and Luther where 106 carefully selected cases are studied with detailed orthopedic examination. It was their conclusion that the favorable effect is shown by:

1. A low mortality.
2. A low average paralysis.
3. A strikingly low paralysis of the severer grades.

In the Ottawa epidemic in 1929, Lower and Shirreff emphasized the value of treatment early in the disease by comparing the high incidence of paralysis in the first four weeks of the epidemic (before the profession and the public became aware of the early symptoms) with the low incidence of paralysis in the last nine weeks.

With the definite experimental evidence on

(Continued on Page 13)

Arthritis and Rheumatic States: Modern Therapy

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FEW diseases are more deserving of attention than that common, painful, obstinate malady, arthritis—obscure in its origin, its phenomena unexplained and its treatment still quite unsatisfactory.

With no idea of expounding new theories, presentation of 218 cases of arthritis and rheumatic states is made and special attention is directed to the present state of therapy in its more recent developments. These cases are taken from the records of the Milwaukee County Hospital, which were studied during the course of an internship and residency at that institution.

In order to discuss a rationale of therapy some definite classification must be established. The fact that there are at least a half dozen very good classifications sponsored by recognized authorities bears eloquent witness to the obscurity still surrounding the question of etiology and pathogenesis. Goldthwait[1] in 1904 proposed the well known classification of infectious, atrophic and hypertrophic; and since that time many justified modifications have been offered, especially by Ely,[2] Painter,[3] Cecil,[4] Bartlett,[5] Munk,[6] and others. The division of Kerr-Pringle[7] seems most suited to a study of therapy.

A. *Rheumatic Type*
   1. Rheumatic Fever
   2. Subacute Rheumatism

B. *Non-Articular Type* including myalgia, fibrositis, torticolles, pleurodynia, lumbago, sciatica and neuritis.

C. *Chronic Joint*
   1. Atrophic or rheumatoid, including Still's Disease.
   2. Hypertrophic or osteoarthritis.

D. *Gout.*

The veil of ignorance still seems to mask the question of etiology. Theories are plentiful but not conclusive. Lowered resistance, chronic afflictions, foci of infection as well as nervous irritability, heredity and constitutional construction, no doubt are all concerned in precipitating the arthritic syndrome. Intestinal stasis is probably a great factor in the etiology but no one definite organism has been conclusively isolated, although, practically all recent studies tend to show the streptococcus intimately concerned.

Ely[2] insists that protozoa are responsible for the hypertrophic form. Pemberton[8] ascribes the phenomenon to a vaso constriction of the peripheral vessels of toxic or neurological origin. Key[9] has produced hypertrophic arthritis by mere trauma. Cecil[4] believes ischemia and trauma the causative sine qua non. Probably each theory is in some way or other a part of the multiple forces causing the physiological disturbances resultant in the arthritic state.

The characteristic pathological findings and symptomatology are well known and to them nothing has been added of recent years.

Concerning therapy, arthritis and rheumatoid states, like all other medical conditions, respond well to the antiquated rule of therapeutics: "Eliminate, sedate, put the part to rest and, if chronic, stimulate."

I. Prophylaxis in this revolutionary era of medicine—preventative medicine—is probably the most desirable form of treatment; but very unfortunately, has not as yet taken firm root in the minds of the general public. The following points, however, experience teaches, are worthy of deep concern:

a. Foci of infection should be eradicated early, even during the acute stage, as Fordyce[10] demonstrates when he reports good results with 40 per cent tonsillectomies in 531 cases regardless of how acute the condition was. Carious teeth, diseased tonsils, chronic prostatitis, sinusitis, salpingitis—these and other intoxicating conditions must be dealt with early. Early is the keyword.

b. Dietary peculiarities must be altered. Excessive carbohydrate consumption should especially be avoided.

c. Colonic stasis and chronic constipation must receive the fullest attention. Mild laxatives and cautious diet are corrective of the condition.

d. Postural habits should be corrected.

e. Neurasthenics require re-education.

If, in spite of all prophylactic measures, an arthritic condition develops it must be attacked by every means possible. To quote Hall[11]: "Attacking the problem with any one therapeutic measure is too often like firing at the head above the ramparts instead of the fortification itself." Experience outlines the following therapeutic

measures as most adaptable and valuable forms of present day treatment.

II. Rest is probably the most important form of arthritic therapy. Too often it is neglected. It is the sine qua non in the treatment of rheumatic fever and subacute rheumatism where cardiac injury is common. Here the absolute rest of thrombophlebitis is none too rigid; postural changes should be few and ice kept constantly over the heart. In the non-articular forms, especially the myalgias, and lumbago, spectacular results follow local rest thru the agency of adhesive supports.

Rest is the cardinal essential in the prevention of deformities in the early cases of hypertrophic arthritis. In atrophic arthritis alone, is physical rest contra-indicated. Rest in its physical phase alone is not sufficient but must also embody the systemic and mental phases as well, so that the patient may be able to combat the ever present fatigue which results from fighting the disease and enduring the various forms of therapy. Not infrequently treatment fails simply because the patient's mind is not at rest. Every effort must be made to relieve the patient of worries and responsibilities; then rest is complete.

III. Physiotherapy: Few, if any, cases of chronic arthritis can be expected to recover without some physiotherapy. Pemberton[12] indicates the desired effects: "To maintain and increase circulation in the joint; to correct physiological processes in the soft tissues and to compensate for lack of muscle activity following protracted disability. Thus we are able to restore much muscle tone and bulk to atrophic muscles." Massage should be employed in the neighborhood of, but never over, the site of joint involvement so that it does not add further injury to the already present inflammatory process. Gentle stroking, gentle compression, but never pinching, is the routine. With the exception of atrophic arthritis joint motion is as a rule contra-indicated. Other contra-indications of massage are fevers, myositis, phlebitis and other acute states. Kerr-Pringle,[7] Laquer,[13] and others recommend local heat thru the agency of infrared lamps and Turkish, steam and mud baths; and thereto, no doubt, can be ascribed the success enjoyed by our prominent health spas and sanotoria.

IV. Diet and Elimination should be the early consideration of a physician who is confronted with a case of arthritis, most especially the rheumatisms. Detoxification should begin as soon as foci have been removed. Large quantities of fluids and mild laxatives, experience teaches us, are a very necessary part of the therapy. Colonic irrigation in its present popularity is very adaptable to the process of detoxification and rectifying the state of colonic dilitation.

Since elimination is important it follows that control of intake is also important. As Pemberton,[12] Fletcher,[14] Coates[15] and Snyder & Traeger[16] with many others agree probably the diet of choice is one with:

a. Normal protein intake if protein metabolism and kidney function are normal.

b. Normal fat intake to be increased in the atrophic form.

c. Low carbohydrate diet preferably, since Pemberton[17] shows that there seems to be a delayed removal of ingested glucose from the blood stream. Carbohydrates to be increased in the debilitated.

d. Low caloric value.

e. Adequate amount of vitamins.

With a diet embracing the above principles and rich in fresh fruits, vegetables, milk, eggs and alkali substances, splendid results follow. A light diet, accompanied by large quantities of alkaline fluid, is found to be desirable during the acute stages. Hall[18] adds large doses of calcium lactate to the above diet in cases of atrophic arthritis.

V. Drug Therapy: The first consideration, from the standpoint of the patient, is relief from pain and discomfort that generally accompany the onset and rapid progress of rheumatoid involvements. The effects, not the cause, at this stage of treatment is uppermost in the patient's mind and as he seeks relief measures first and combatative measures second, an early relief, if not immediate symptomatic result, must be obtained.

A. *Analgesics:* 1. Sodium Salicylate, by its antiquity, if nothing else, ranks first in the field of analgesics. It is rapidly absorbed, diffused thru the body and eliminated thru the kidney with slight tubular irritation. To avoid this irritation, alkaline adjuncts are constantly used.

It is the drug par excellence of rheumatic fever and might well be considered a specific. In 34 cases of acute rheumatic fever studied, where Sodium Salicylate in doses of 30 to 60 grains three times a day, accompanied by sodium bicarbonate, fluids, diet, rest, cardiac stimulants and supportive measures, was used 83 per cent were found to have a normal temperature and be relatively free from joint symptoms on the twelfth day.

In chronic cases, however, Sodium Salicylate has been found to be of diminished value. In this series, 26 cases were treated for 20 days, receiving daily 75 grains of salicylate and only

four showed slight improvement. This seems to be a general average. Because of its antiquity and its definite value in the acute forms, many of us cling tenaciously to it in our chronic cases and hereto can be attributed our failures in arthritic therapy.

2. *Cincophen* is perhaps the most prominent analgesic of the day, originally considered a specific for gout, but more recently found to be very effective in the subacute rheumatisms and chronic joint afflictions. It will be noted from the report of Dr. Rabinowitz[19] that of the fifty cases of acute yellow atrophy of the liver reported, only three resulted from the use of U. S. P. Cincophen alone. This seems to be a danger, yes; but a minor danger when one considers the annual consumption of approximately 100,000 pounds of Cincophen in the United States.

In a clinical series of 97 cases studied by the author wherein a new drug was used, Mono-Iodo-Cincophen Compound supposedly of lessened toxic possibilities because of the addition of Iodine to the cincophen molecule (Corson White[20]), very satisfactory results were obtained.

Total improvement of 82.4 per cent in all studied cases with observed idiosyncrasy of 4.1 per cent manifested by gastric upsets, headache and malaise, coincides closely with the clinical reports of Ross[21] in 1,255 cases, Potenciano,[22] Markson,[23] Rudnick and Burstein[24] and Fahlstrom.[25] Mono-Iodo-Cincophen Compound was found most adaptable to the subacute forms, the non-articular types and hypertrophic arthritis. In acute rheumatic fever it proved unsatisfactory and seemed of little value in the atrophic forms. A case of arthritis, resultant from injections with diphtheria toxin-antitoxin responded very well and it produced immediate relief of the rheumatic symptoms in a case of Schoenlein's Purpura (Fig. 1).

Further observations showed an average gain of 1.7 pounds in weight in a short studied series and an average erythrocyte increase of 70,000 in twenty-seven studied cases of this series. Erythrocyte study was prompted by experimental research which showed erythrocyte destruction in animals injected with the compound.

Improvement was rapid between the fourth and tenth days of treatment (Fig. 2). The marked

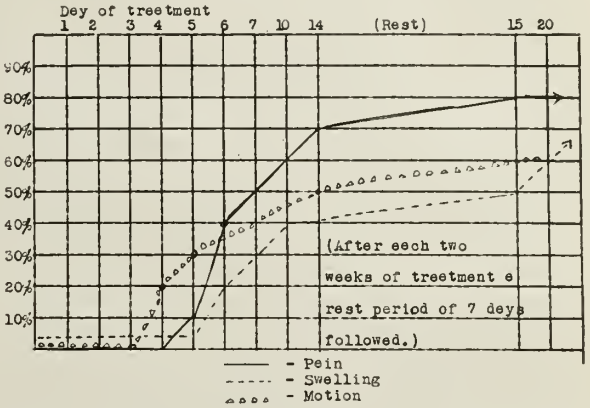


FIGURE 2

The relative percentage of average improvement in the treatment of 76 cases of non-articular and subacute rheumatism, gonorrheal, menopausal and early hypertrophic arthritis with Mono-Iodo-Cinchophen Compound.

reduction of swelling, relief of pain and restoration of motion are probably due to a great extent to the iodine which stimulates and regulates metabolism and the cincophen which relieves pain.

3. *Aspirin, Pyramidon, Phenacetin, Emperin Compound* and the more potent analgesics—*Amytol, Pantopon, Morphine,* etc.—have a very restricted use in the more painful forms, their effect being only transitory.

B. *Non-specific Drugs:* In a series of 36 cases of various rheumatic states, injections of killed typhoid bacilli were made in ascending doses from fifty million to three hundred million at three

FIGURE 1

MONO-IODO-CINCHOPHEN COMPOUND

Classification	Cases	Age*	Duration Disease*	Intolerance	Improvement		
					Marked	Moderate	None
Rheumatic Fever	6	27	8.4 days	0	0	3	3
Subacute Rheumatism	12	31	11.0 days	1	8	2	1
Non-articular							
a. Myalgia	14	33	3.0 days	1	10	3	0
b. Neuritis	9	24	16.0 days	1	5	2	1
c. Lumbago	9	27	2.4 days	0	9	0	0
d. Sciatica	6	36	7.6 weeks	1	3	1	1
Hypertrophic	15	47	5.3 months	0	9	4	2
Atrophic	7	44	11.2 months	0	1	2	4
Gonorrheal	12	26	27.7 days	0	9	2	1
Menopausal	5	48	2.5 months	0	4	1	0
Allergic Arthritis	1	24	4.0 days	0	1	0	0
Schoenleins Purpura	1	34	9.4 days	0	1	0	0
	97	33.3 yrs.		4	60	20	13

*Average.

82.4% showed improvement moderate to marked.

4.1% were intolerant to the treatment.

1.7 pounds gain in weight was noted in 32 cases on the 20th day.

70,000 average erythrocyte increase was noted in 27 studied cases after 20 days of treatment.

day intervals. Following the injection, ten or fifteen minutes, there was a chill of variable severity and duration after which the temperature rapidly rose to an average of 102.6 F., falling to normal by lysis in an average of 11.5 hours. Improvement was spectacular for two to seven days following the injection, pain and swelling decreasing and motion becoming less painful. This splendid temporary result is ascribed to many different things: By some, to the observed average leucocytosis of 9,200 in this series; by Pemberton to the increased peripheral circulation; while Shahon[26] asserts that there exists in the body non-specific splitting enzymes which attack various invading protein toxins and that these enzymes are activated by the injections.

It was determined, unfortunately, that by the twelfth day after the last injection of a series of six, the spectacular improvement noted early in the series had vanished and 92 per cent of the treated cases had returned to the existant condition present at the beginning of treatment or very close thereto. In eight cases where Sodium Salicylate, in 30 grain doses three times a day, was used as an adjunct, the permanent improvement was considerably greater; this was also true where oxyl-iodide was used in five cases. In nine cases Mono-Iodo-Cinchophen Compound was used as an adjunct in doses of seven and a half grains thrice daily, despite warnings as to the especial danger of using a cinchophen product with foreign protein injections, and permanent improvement of approximately 75 per cent was observed with no baneful effects.

In 15 cases, predicating Crowe's[27] theory for foreign protein failure, namely the excessive doses of vaccine, lower tissue resistance and enable the arthritic process to proceed more easily, injections were made—a series of six, at six day intervals, in doses ranging from ten million to thirty million killed typhoid bacilli. Here, not only the permanent, but also the immediate effects were very unsatisfactory.

C. *Specific Drugs:* 1. Emetin. Ely[2] and Exelby[28] after isolating the entomoeba histolitica from the stools of patients afflicted with hypertrophic arthritis, recommend the use of emetin hydrochloride, 12 injections of one grain each, to be followed by emetin bismuth iodide, one to two grains daily for seven days. Neoarsphenamine was recommended as a supportive measure and cardiac injury as the only contra-indication to this therapy. Of 589 cases reported in the literature, 66.3 per cent showed marked improvement.

2. Autogenous and Stock values.

a. The polyvalent streptococcus vaccine of Crowe[27] is being used with a high percentage of improvement in the chronic forms throughout Europe. It was not included in this series.

b. In 1927 Small[29] presented the streptococcus cardioarthritidis antigen and antiserum, now in much use throughout this country. In eight chronic cases studied in this series, splendid improvement of 60 per cent was observed. In a case of Sydenhams chorea, movements ceased permanently following three injections of 0.05 cc. of the 1:1000 dilution of antigen and a case of rheumatic fever became symptom-free in nine days following injection of 30 cc. of bovine antiserum within 24 hours and accompanied by sodium salicylate, 20 grains, three times daily. Of the eight chronic cases, one of nine years duration was well on the road to complete recovery after thirteen days of treatment.

D. *Tonics and Stimulants:* While treating the more or less localiszed process, systemic conditions must also be considered, especially in cases of atrophic arthritis where debility is ever present. Arsenic, strychnine, iron, vitamins, calcium and others are all of great value in preserving the patient's vitality. Digitalis should be regularily employed where indicated in cases of cardiac injury. In this series a drahm of the elixir of iron quinine and strychnine was used three times daily as a routine procedure.

VI. Surgery: The application of surgery to arthritis is still in the process of development. Sympathetic ganglionectomy as recommended by Rowntree and Addson[30] and the plastic work of Jaroschy[31] promise much, especially for the deformed patient afflicted with atrophic arthritis. Further work in this field is to be observed with much anticipation.

Conclusions

A series of 218 cases of arthritis and rheumatic states from the records of the Milwaukee County Hospital were studied with special reference to therapy; and literature reviewed. The etiology of the conditions remains in dispute; streptococci seem, however, intimately related to pathogenesis. With regard to therapy: After eradication of foci of infection, rest, physiotherapy and diet must be in order. Sodium Salicylate remains the drug par excellance of rheumatic fever. Mono-Iodo-Cinchophen Compound appears to be a most useful analgesic in the subacute and chronic forms and no baneful effects were noted following its systematic use. Emetin is claimed to be specific for hypertrophic arthritis; and atrophic arthritis and Still's Disease respond best to vaccine therapy.

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POLIOMYELITIS: A REVIEW OF THE LITERATURE

(Continued from Page 8)

monkeys and the favorable observations on human beings, convalescent serum is being accepted as specific therapy in the preparalytic stage of poliomyelitis.

Experience has taught us that it is just as important to recognize and treat poliomyelitis in the non-paralytic stage, as it is to recognize and administer antitoxin early in diphtheria.

Treatment of Paralysis

If treatment is begun at the onset of paralysis, massive doses of convalescent serum may be of some value, but no definite data are obtainable.

Treatment in the *post-paralytic* stage resolves itself essentially to orthopedic care. Absolute rest with the least possible strain on the paralyzed muscle is essential. Light splint should be used. It is extremely essential to prevent deformity by proper position and support. Splints should be removed as soon as functional activity begins to return.

Massage, light exercise, muscle training and diathermy are very important, but these should not be begun until pain has disappeared, and at all times fatigue must be avoided. Results with orthopedic care reported by Dickie have shown that improvement may be expected for a period of two years after the onset of paralysis.

General Conclusions

1. Our most important problem in arresting the scourge of anterior poliomyelitis is the diagnosis of these cases early. More thought and study should be given to the early symptoms and signs of this infection by the men who are called to see these cases first, namely, the general practitioner and pediatrician. The serum treatment has proved its value and should be given even in those cases where the diagnosis is questioned, or up until the second stage is reached.

2. The treatment of the secondary or convalescent stage is grossly neglected, thus more care and supervision should be given this most important phase of the malady. More can be done for these unfortunate children during the first few hours or days of their illness than at any subsequent time.

3. If an early diagnosis is made and proper treatment instituted during the febrile stage, the resulting cord involvement is not only lessened but in a great percentage of cases is prevented.

4. Proper treatment for the first or active stage consists of absolute rest, relief of fever, early and frequent spinal drainage to keep the spinal pressure down, and intravenous or intramuscular specific serum treatment.

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MINNEAPOLIS, MINN., JANUARY 1, 1934

TIME AND WORK

Time has pushed 1933 into the background, and started on 1934. We pause a moment to meditate.

One of the greatest blessings that can come to anyone is the capacity for work and the enjoyment of it. Everyone possesses these qualities in some degree, and if he makes good use of time, time will surely make good use of him.

"Dost thou love life? Then do not squander time for that is the stuff life is made of."

May abundant health and a full measure of that happiness which work brings, be yours this livelong year.

A. E. H.

A HALF CENTURY OF MEDICAL PROGRESS

In 1933 occurred the fiftieth anniversary of the entrance into medicine of our friend and neighbor, Dr. W. J. Mayo, to whom we take this opportunity of extending our warmest felicitations on having reached this landmark in his notable career.

It would be superfluous to attempt to set forth the details of Will Mayo's achievements, well known as they are to all and officially recognized by institutions of learning and important professional organizations all over the world.

Let it be enough to say here that the outstanding feature of his leadership, with all that goes with it, has been and will continue to be the tremendous impetus his influence has given to the development of his craft wherever scientific medicine is practiced.

We wish him many more years of health, happiness and usefulness.

G. C.

LOOK FOR MALTA FEVER

Physicians in this territory have given little thought in the past to the possible presence among them of so foreign sounding a disease as Malta fever.

Now that quite a few cases, after baffling diagnosticians, have been proven by seriological and pathological study to have been of this nature, it becomes highly important that every practitioner have Malta or undulant fever daily in mind. It becomes all the more necessary because of the similarity of many of the symptoms and signs to those of influenza, typhoid and other diseases prevalent here. And finally, it must be remembered that this is a dairy country. Goats, cattle and swine, with their products, are the chief sources of infection for man, raw milk or other unpasteurized dairy products containing *Brucella*, or the direct contact with infected fresh animal tissues.

Anorexia with abdominal pain and constipation is an early complaint that may be confusing.

When the pain is located in the upper right or lower right quadrant, it may naturally be mistaken for that of cholecystitis or appendicitis. In such cases, the leucocyte count and agglutination test for undulant fever may both be necessary in order to clear up the diagnosis.

A. E. H.

PROFESSIONAL PUBLICITY

Modern inventions have done much to facilitate the diffusion of knowledge and break down the artificial barriers which from time immemorial have encompassed all professional activities. The printing press, the facilities of transportation and travel, the telegraph, the telephone, the mails and the electric light in its various utilities have all contributed to bring accumulated information of all kinds to the reach of all who seek it, with a minimum of cost and difficulty.

The perfection of the radio has provided another and most powerful agent in this dissemination of knowledge and its possibilities were quickly realized and utilized by commercial enterprises of all sorts. It is refreshing and encouraging to see that the professions are alert to the situation and are making full use of the opportunity. In Minnesota the broadcasts of the State Medical Association in the capable hands of Dr. W. A. O'Brien have achieved a great deal of good in furnishing the lay public with much-needed information about prevalent diseases and giving common sense advice regarding hygiene, preventive medicine, the relations of physicians and patients and many similar subjects. Much benefit has accrued and a striking amount of interest has been aroused.

Our brethren of the legal profession are now doing the same thing. Every Sunday at 11:45 a. m. a prominent lawyer talks over WCCO on an assigned subject dealing with some legal problem in which the public is concerned and interested, under the sponsorship of the State Bar Association. These broadcasts by competent members of both professions should go far to counteract the efforts of selfish individuals whose only aim is the exploitation of personal interests but what is even more important, they should have a wholesome effect in strengthening public interest and confidence in the broadest concepts of law and medicine.

G. C.

FERTILITY AND LONGEVITY

Darwin observed that fertility throughout the whole animal kingdom is in direct proportion to the chances of death.

This benevolent provision of nature insures a continuity of the species; but what a train of thought it brings to mind! Living in a period of advanced enlightenment, we have built up protecting barriers against disease and danger. Struggles have not entered into the scheme of existence. We have become "cream puffs" accustomed to sit in the lap of luxury thinking only of ease, comfort and self enjoyment.

Call it what you may, something is now at work to correct this incongruity. Artificial immunity is all right in its place but by and large, it only serves to coddle those individuals who lack native stamina and have failed to build up resistance by contact and combat. In years gone by we developed immunity through environment, physical exertion and cold baths; now we avoid effort, have the tonsils out and take a shot in the arm. Once upon a time, a bucksaw and a cord of wood were considered good remedies for a cold but now we must have pretty pills and more "shots" to supply an attenuated specimen with the resistance that it cannot itself develop.

We boast about increased longevity in the human race—but at what expense? Life should not be measured by a mere span of languid years. It should be rated by the accomplishments of an active life. If we cannot combine the benefits of scientific discovery with the advantages that accrue from a strenuous life beset with dangerous adventure, then we must choose between dull senility as our goal or a shorter but more vigorous and interesting existance.

A. E. H.

CORRECTION

Through an error, proofs of Dr. J. O. Arnson's discussion of the paper by Dr. Aleno E. Pierce on "Coronary Thrombosis" failed to reach Dr. Arnson and there appeared a number of mistakes in his discussion. We are, therefore, republishing Dr. Arnson's discussion. Dr. Pierce's paper appeared on page 667 of the December 15th issue.

Discussion

Dr. J. O. Arnson, Bismarck: I agree with the essayist and will limit my remarks in discussing this paper to supplementing some phases of the subject that it was impossible to cover in a brief paper. I have brought some electrocardiograms to show you, inasmuch as Dr. Pierce mentioned the fact that the progressive changes in the electrocardiograms are sometimes an invaluable aid. Despite the fact that coronary thrombosis is often

easily recognizable, especially when you have large areas of infarction of the heart muscle, nevertheless there are many cases with lesser degrees of pathology that baffle ordinary diagnostic procedures.

I will show you a normal electrocardiogram, especially as it relates to the S. T. interval and the T waves. The most interesting changes in coronary thrombosis take place in the S. T. interval and the T waves. As Dr. Pierce stated, a great many of these patients show no physical signs and apparently their hearts are normal. The electrocardiograms sometimes give no information, but there is one characteristic change which when present is always associated with coronary thrombosis and that is a high origin of the T wave from the descending limb of the R wave and elevation of the S. T. interval with subsequent depression of the T wave. Electrocardiographic evidence of intraventricular block sometimes follows coronary thrombosis.

The first slide is an electrocardiogram of a frank case of coronary thrombosis taken about three hours after the acute attack. It is characterized by a high take off of the T wave and elevation of the S. T. interval well above the isoelectric line in the first lead.

The second electrocardiogram taken of the same case five days later reveals a disappearance of the elevation of the S. T. interval and the development of negativity in the T wave, a change which frequently takes place during the course of coronary thrombosis.

The third slide shows an electrocardiogram from another case of coronary thrombosis and reveals the characteristic high take off of the T wave and the elevation of the S. T. interval in the first lead.

The fourth slide shows an electrocardiogram from the same patient, two weeks later, wherein the negativity of the T wave has taken place with a disappearance of the high take off of the T wave and elevation of the S. T. interval. These two cases probably represent involvement of the left coronary artery.

The fifth slide is presented because it shows some difference from the preceding electrocardiograms. The high take off of the T wave and the deviation of the S. T. interval from the normal iso-electric line occurs in the third lead, indicating involvement of the right coronary artery.

Recent evidence indicates that when thrombosis in the right coronary artery occurs, the S. T. interval is elevated and later the T wave is depressed in the third lead. While, if it is due to a left coronary thrombosis, the S. T. interval will be elevated and later the T wave depressed in the first lead.

Proceedings Minnesota Academy of Medicine

Meeting of November 8, 1933

The regular monthly meeting of the Minnesota Academy of Medicine was held on Wednesday evening, November 8, 1933, at the Town & Country Club. Dinner was served at 7 o'clock. The meeting was called to order at 8 o'clock by the president, Dr. C. D. Freeman. There were 65 members and one guest present.

Minutes of the October meeting were read and approved.

Dr. George D. Head, chairman of the Necrology Committee, read the following Memorial to Dr. John W. Bell, a charter member and former president of the academy.

John Wesley Bell, M.D. 1853-1933

The Minnesota Academy of Medicine is again called upon to mourn the passing on of one of its oldest and most revered members, Dr. John Wesley Bell. This pioneer physician of the state was born March 18, 1853, in London, Ohio, the son of Robert J. and Ann Bell. His father was a farmer and his early education was carried on in the public school system of that state. In 1876 he received his medical degree from the Ohio Medical College following which he pursued postgraduate work in London and in Germany.

Six years later he settled in Minneapolis where he began a career of more than fifty years in the practice of our profession. In 1886 he was elected Professor of the Theory and Practice of Medicine at the Minnesota Hospital College and two years later he was made Professor of Physical Diagnosis and Clinical Medicine at the Medical School of the University of Minnesota and served a period of twenty-eight years in active teaching. He was elected to the Minnesota State Senate from 1891 to 1895. He was appointed a member of the Minneapolis Charter Commission. When the Hennepin County Tuberculosis Sanatorium was established he was chosen a member of its commission and served until his resignation in the year 1919.

During his long medical career he received many honors. He was president of the Hennepin County Medical Society in 1902 and of the Minnesota State Medical Association in 1905. He was a Charter Member of this academy and was elected its president in 1894. He was a member of the American Gastro-Enterological Association, and was elected an Honorary Member of the Minnesota Society of Internal Medicine.

He was married November 11, 1890, to Kate M. Jones, who, with two sons, Dr. Warren Bell and Robert Bell, survive him. He died May 16, 1933.

These, in brief, are the recorded facts in his long and useful life. But it is not the recorded achievements of life which build enduring memories. A man of quiet personality, unusually modest, considerate of his fellow practitioners to a remarkable degree, beloved by his patients, his memory will live in the hearts of those who have known him long after the deeds of more aggressive men have been forgotten. There are important achievements in his useful life which demand specific notice: His career as a member of our profession and as a consultant, his services in medical education, and his contribution to the literature of his day. It is of these outstanding landmarks that we wish to speak.

Never a robust individual, Dr. Bell carried on a very active practice in medicine over many years. Unremitting in his labors, out early each day, he was strict in keeping his appointments and he made it a matter of professional honor always to be at his consultations on time. Many of those who had been his former pupils looked to him as their consultant and modeled their ways after his.

With unusual clinical powers of observation, an accurate diagnostician, he had a genuine sympathy for his patients and he maintained in his relations with them the highest ideals of courtesy and kindness. His whole life was given over to the interests of medicine. He had other activities but they were of relatively minor importance. At his death he left behind him countless friends among the rich and poor.

As a member of the original Faculty of the School of Medicine of the University of Minnesota, Dr. Bell is mentioned in the minutes of the Board of Regents' meeting in 1888. He served as Professor of Physical Diagnosis and Diseases of the Chest from 1891 to May 1905, at which time he was made Emeritus Professor of Physical Diagnosis and Clinical Medicine and served as such to the date of his death. His addresses to the Senior students of the Medical School upon medical ethics and medical economics were given subsequent to his retirement from active teaching. As late as one year ago, Dr. Bell, gave one of these lectures upon Medical Ethics full of practical advice and sound counsel to young practitioners.

It is impossible to estimate the profound influence of this man's lectures upon the young men entering the profession, as Dr. Bell was, both of precept and example, the "Admirable Crichton" of medicine. We who were at first his students and later his confrers can only now honor him by striving to reach the heights he so often exhorted us to work toward. Truly there is a "lonesome place left against the sky" since John Bell died.

His contributions to medical literature are comprised in eighteen bibliographic records which we have been able to find and which we wish to record.* The subjects treated are varied, five are devoted to the heart and its diseases, three to pulmonary tuberculosis, three to gastric diseases (cancer and ulcer), and three upon such general topics as medical ethics and medical economics, rational therapeutics, etc. Quotations from some of these writings reveal the character of the man.

In a paper upon "The Early Manifestations of Pulmonary Tuberculosis," he writes, "Pulmonary tuberculosis is emphatically a disease of all times, all countries and all races. No climate, no latitude, no occupation, no combination of favoring circumstances affords perfect immunity. It invades alike, the homes of the rich where every comfort abounds, and the abodes of the poor where the misery of a hopeless disease is rendered more miserable by the pangs of poverty and neglect."

In a paper on the senile heart he says, "I desire to emphasize first the necessity, yea the obligation for early and prompt recognition of the danger signals indicative of beginning senile cardiac insufficiency, believing that no practitioner is justified in ignoring or passing as unworthy of therapeutic attention the breathlessness, precordial distress, and irregularity of the pulse, so often encountered after middle life."

In his presidential address before the state society in 1905, "A Need for More Rational Therapy," he says, "As physicians we should remember that in the eyes of the people, treatment is everything, the Alpha and Omega of Medicine." "As a profession we have directed all our efforts and energy to the investigation, detection and prevention of disease, leaving the individual ill with disease to take care of himself." "I know of no man in or out of our ranks so

positively harmful and detrimental to the progress of medicine as the therapeutic nihilist."

In his address on medical economics delivered to the Senior class of medicine in 1928, we read, "A professional life may be likened to a road or highway and success its destination. He who keeps on the highway and follows the road signs usually avoids the bumps and saves worry and expense." "Medicine has for its prime object the service it can render humanity but the physician must live in order to render the service." "A physician is a public personage and should manifest an interest in the community."

In his lecture on Medical Ethics, delivered at the Medical School in 1927, we get many sidelights upon Dr. Bell's character. To quote from the lectures, "It is well to remember that more men fail in the practice of medicine from the inability to understand and manage people than from ignorance of the science of medicine, colossal as the latter may be at times." The future of medicine rests with the students of today." "The physician's life is a strenuous one but its rewards are many and within the reach of all who sincerely seek to serve humanity." "The ability to inspire confidence, natural to some, is a most valuable aid to a physician." "Sympathy more than any other quality wins the hearts and confidence of patient and relatives." "The physician should remember that scandal is like an egg—when it is hatched it has wings." "He should remember that the poor are his first and most loyal patients." "No individual carries greater responsibilities to the generation in which he lives or the community in which he practices than the physician." And finally he pronounces his own benediction in these words, "And when life's day is spent and evening is announced by the inelastic step, the dimmed vision, the impaired memory and the hardened arteries, the frail old man returns to his friend of the morning to be relieved and comforted until his eyes are closed in the eternal sleep."

And now we have turned the leaves in his book of life; the last page has been read. We close the volume. Stimulated by his achievements, his wisdom and his faith and example, we fix our eyes upon the future of our beloved profession with hope and courage.

THE COMMITTEE:
Arthur S. Hamilton,
John E. Hynes,
Geo. Douglas Head,
Chairman.

Dr. E. L. Gardner, Chairman of the Necrology Committee, read the following Memorial to Dr. Emil S. Geist, a past president of the Academy:

EMIL S. GEIST, M. D.
1878-1933

Dr. Emil Geist was born in St. Paul, Minnesota, on May 9th, 1878. Following his graduation from the Medical School of the University of Minnesota in 1900, he served one year as an interne at St. Joseph's Hospital in St. Paul, and then spent three years doing postgraduate work in Paris, Breslau and Vienna. In Breslau he was associated with the noted surgeon, Mikulicz, at a time when Sauerbruch was associated with the clinic, and in Vienna he studied and formed a lasting friendship with Dr. Adolph Lorenz. Upon his return home he entered the practice of orthopedic surgery in Minneapolis, where he was active until his death.

In 1911 he married Miss Augusta Ohage, daughter of Dr. Justus Ohage, of St. Paul.

Dr. Geist served as major in the Medical Corps of the United States Army during the World War, and conducted schools of orthopedic surgery at Fort Oglethorpe, Georgia, and Fort Sam Houston, Texas.

His name will best be remembered for his contributions to Orthopedic Surgery. He was the founder and "Father" of the Minnesota Orthopedic Surgery, and served as a teacher or orthopedic surgery at the Medical School of the University for many years. He was head of the orthopedic department of the Minneapolis General Hospital for many years, and was on the active staff of all the private hospitals in Minneapolis. He was a very active member of the American Orthopedic Association, and he became a charter member of the International Society of Orthopedic Surgery founded in Paris in 1930. His contributions to medical journals were many and important. He was particularly interested in the progress of his specialty and rarely failed to attend the meetings of any important orthopedic society in America or abroad.

He was an active member of the American Medical Association, the American College of Surgeons, the Minnesota State Medical Association, the Hennepin County Medical Society, the Minnesota Pathological Society and the Minnesota Academy of Medicine. In 1928 he served as president of the Hennepin County Medical Society, and in 1930 the Minnesota Academy elected him its presiding officer. He was a member of Alpha Kappa Kappa Medical Fraternity and of the Minneapolis Club.

Dr. Geist had an unusually active mind not only in medicine but also in music, art, literature, languages and outdoor life. His main diversion was to invite various members of the Minneapolis Symphony Orchestra to his home for evening dinner and then spend several hours playing chamber music during which he played a score for the violin. His speaking knowledge of European languages broadened his acquaintance and developed a real cosmopolitan viewpoint. Dr. Geist was in unusual demand for holding clinics, not only for his mastery presentations but also because of his genial, whole-hearted nature which made friends in all his contacts. No one ever gave more time to unfortunate physicians and their families or to the poor who could not pay a fee. He never thought of saving himself until he suffered his first coronary attack about five years before his death. To his great credit he was able to adjust his habits and his mental viewpoint in spite of the knowledge his end might come at any time. He, on several occasions, had stated that each added year was a gift of fate and that he was enjoying and making the most of each day as it came, without fear of the end.

Death came suddenly on May 14, 1933, at his home a few hours after he returned from a meeting of the American Orthopedic Association in Washington. He is survived by his wife, one son, Justus John, and two daughters, Annamarie and Louise.

The Minnesota Academy of Medicine mourns not only the loss of a loyal member, but also the contact with a whole-hearted stimulating personality.

THE COMMITTEE,
Gustav Schwyzer,
Wallace Cole,
E. L. Gardner,
Chairman.

THE EYE IN CARDIOVASCULAR DISEASE

by

Arthur Edward Smith, *M. D.*
Minneapolis

Abstract of Inaugural Thesis

Increased incidence of cardiovascular disease in past three decades. Due to greater prevalence of cases of coronary sclerosis-hypertension group.

Reasons for characteristic reaction of the eye tissue to the effects of disease of the heart and blood vessels. Unique opportunities for observation of the presence and progress of vascular pathology in the fundus of the eye.

Classification of diseases of the heart and blood vessels affecting the eye.

Significance of pulsation of the retinal vessels.

Etiology and essential nature of hypertension, with description of fundus changes observed in the various forms of hyperpiesis, including the hypertensive toxemia of pregnancy.

"Albuminuric retinitis"—an obsolete and misleading term, since albuminuria has no bearing upon the condition which is a degenerative rather than an inflammatory process. In retinopathy associated with kidney disease hypertension is the underlying factor which is primarily responsible for both the nephritis and the retinal lesions.

Types of kidney disease associated with retinal pathology.

Prognostic significanace of hypertensive neuroretinopathy. Pathologic anatomy of the eye in hyperpiesis.

Arteriosclerotic retinopathy—may exist as a distinct entity or be associated with hypertension. Characteristic fundus picture. Advanced arteriosclerotic changes in the fundus (especially in senile arteriosclerosis) often seen in the presence of normal visual acuity. Pathologic anatomy of arteriosclerotic retinopathy.

Discussion of types of primary vascular disease, etc. Effects of the various dyscrasias and diseases of the blood affecting the integrity of the capillary walls, with resultant hemorrhage, etc.

Difficulties encountered in the study of the microscopic pathology of the eye. Scarcity of material for examination. Most enucleated eyes are the seat of advanced pathological changes and there are few opportunities for making microscopic examinations of eyes in the earlier stages of disease.

In the future, probably most of the advancement of our knowledge in regard to the eye pathology in cardiovascular disease will be achieved through improved methods of clinical examination with the slit lamp, the newer types of magnifying ophthalmoscopes, employment of short-wavelength light, etc.

SOME EXPERIENCES IN SURGERY OF THE COLON

Dr. A. R. Colvin, St. Paul

Discussion

Dr. A. E. Wilcox (Minneapolis): Dr. Colvin has presented this paper in his usual interesting and instructive manner. Regarding the diagnosis in acute conditions of the colon, I presume we will always have more or less the same difficulty; and these difficulties he has emphasized in his remarks and recital of the case histories. After

the pathology is definitely established upon exploration, an analysis of what appeared to be trival symptoms often becomes illuminating.

Carcinoma so seldem gives any suggestive symptoms, particularly of obstruction, until the impaired lumen of the bowel suddenly becomes blocked by some fecal impaction or fruit seeds, that no complaint is made by the patient and surgical contact is delayed until these acute abdominal conditions arise.

What I wish to emphasize particularly in the consideration of Dr. Colvin's paper is the preoperative preparation of the patient. The nasal suction apparatus as devised by Dr. Owen Wangensteen is an admirable means of decompressing the abdomen and getting these cases of obstruction in condition for operative procedure. This method has been presented before this academy and elsewhere by Dr. Wangensteen. We have, since he familiarized us with this apparatus, been much impressed by its usefulness and efficiency in cases of obstruction and have obtained results which we believe make it preferable to cecostomy. I cannot speak too highly of this pre-operative preparation of the patient by the nasal suction method.

Dr. H. B. Sweetser (Minneapolis): I wish to compliment Dr. Colvin on his exhaustive and very instructive paper on diseases of the colon and their treatment. In his report of a case of cancer of the sigmoid he stated that he resected the tumor and reunited the intestinal tube, but that a year afterwards there was a recurrence with numerous metastases. It occurs to me that in our effort to make the post-operative life of our patients not too uncomfortable and inconvenient, we are liable to be too conservative in our surgical attack.

In this connection I would like to report a case I operated upon in November, 1932, one year ago. The patient had an acute intestinal obstruction due to a carcinoma of the sigmoid, low down. I resected the sigmoid, from about six inches above the anus to six inches above the tumor, and implanted the proximal end into the skin, through the split fibers of the rectus muscle as an artificial anus. This man is so far perfectly well and at work daily. His bowels move daily in the morning before he goes to business; he is not troubled with expulsion of flatus, and there is practically no (or little) soiling of his bandage with fecal discharge.

I would like to ask Dr. Wilcox if he depends entirely on the nasal suction to relieve the intestinal distention without a subsequent colostomy, and if it always succeeds.

Dr. A. E. Benjamin (Minneapolis): I want to congratulate Dr. Colvin on his paper; there is much food for thought in it. If one examines all these patients beyond 50 years of age by means of X-rays of the colon, I think he will find a large percentage of them will have diverticula. We know that diverticula can occur anywhere from the esophagus down to the anus. Many fistulae and sinuses from a diverticulitis in the anus occur in these cases. If you will take these X-rays you will not advocate these large enemata with diverticula. I believe many people do themselves much harm by taking large enemata. If these patients use oil enemata and put on liquid or semi-solid diets, some of them will improve. I have a number of patients with diverticula of the colon at the present time who are feeling better. Very few of them will require operation excepting the untreated ones may develop acute attacks. Of course, some of these will have to be operated. It is difficult to cure and many patients develop obstructions. To make a diagnosis between diverticulitis and appendicitis occasionally is rather difficult.

I think a primary colostomy should be done in nearly all of these cases where there is complete obstruction. I have used the nasal suction, as Dr. Wilcox mentioned, before and after operation. After a carcinoma is removed and an anastomosis is performed, it is best that a small opening be left at the site of this colostomy. I do it in such a way that a small vent is left in the bowel for leaking of gas from the bowels for weeks afterwards. This relieves the patients of gas distention and suture tension and prevents a blow-out. I think this is a very interesting subject.

Dr. Gustav Schwyzer (Minneapolis): I would like to mention a patient whom I operated upon seven years ago next January. She was 30 years old at that time. I operated upon her first for an intestinal trouble that looked like appendicitis. There was no blood in the stool, very slight tenderness of the abdomen, but this slight painfulness was more on the right hand side. The bowel movements were normal. Seven months later she came to the office during my absence and my associates found her to have a large tumor in the abdomen, slightly movable, and not markedly painful to touch. As so symptoms of obstruction were existing, the possibility of a foreign body was thought of. On my return in the fall I found, on my examination of the patient, a well-demarcated, large tumor, of irregular form, in the region of the naval. The hemoglobin was reduced to 38 per cent. I ex-

cluded the possibility of a foreign body on account of now discovering blood in the stool. It became probable that we had to do with a malignancy. Repeated gastrointestinal X-ray examinations finally brought out a marked defect in the transverse colon, which findings confirmed our diagnosis. After giving the patient 600 cc. of citrated blood that brought the hemoglobin up to 44 per cent, we incised the abdomen, this time in the mid-line, and found a large carcinoma of the transverse colon, 12 cm. long and 5 cm. thick. I made an end-to-end anastomosis after resecting the cancer of the transverse colon, re-uniting the two ends without any tension, because the splenic and hepatic flexura coli were freed, according to Moynihan. The patient left the hospital in two weeks. She never vomited after the operation and is comfortable today.

I want to mention this case for the reason that it is rare to find such large adenocarcinoma of the transverse colon in a young person. Dr. Benjamin made the statement that the colostomy would be the safest procedure and should be done first. I think his thought is correct in all cases of obstruction, but the ideal way is the one-stage operation with an end-to-end anastomosis if conditions present themselves feasible for this method.

The meeting adjourned.

R. T. La Vake M.D.
Secretary.

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NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. Grattan Fitzgibbon has opened offices for general practice at Sioux Falls, S. D.

Dr. Roy Schnacke, McGregor, was recently married to Miss Viola Cayo, of Tamarack, Minn.

Dr. S. Rosenthal, who retired from active practice at Aberdeen some years ago, died last month from a sudden heart attack.

Dr. Carl Koehn, formerly in practice at Billings, has moved to Glasgow, Mont., where he will continue his general practice.

Fire destroyed the hospital at Fort Thompson, S. D., recently with a loss of $15,000. It is very doubtful if the building will be replaced.

Dr. N. H. Greenman has retired from practice after 35 years of service at Fairmount, N. D., having sold his business to Dr. A. H. Reiswig of Dallas, Texas.

Drs. S. R. Maxeiner, J. M. Hayes, and W. H. Ude, Minneapolis, were guest speakers at the December meeting of the Carver-Scott Medical Society at Waconia, Minn.

Dr. John H. Fairfield, the first physician to locate in Great Falls, Mont., in July, 1885, passed away recently at the age of 78 years, the result of an attack of heart trouble.

Dr. H. E. Michelson and Dr. F. H. K. Schaaf, Minneapolis, were guest speakers at the December meeting of the members of the Central Minnesota Medical Society at Princeton, Minn.

The District Medical Society held their regular December meeting at Watertown, S. D., with Dr. O. J. Campbell, Minneapolis, as their guest speaker, his address being "Cancer of the Breast."

The Mount Powell Medical Society held their annual meeting at Deer Lodge, Mont., last month and elected the following new officers: Dr. F. L. Unmack, president; Dr. A. C. Knight, vice-president, and Dr. L. G. Dunlap, secretary.

The Clay-Becker Minnesota Medical Society

have elected the following officers to serve during the year 1934: Dr. C. W. Simison, Hawley, president; Dr. A. Larson, Detroit Lakes, vice-president, and Dr. O. V. Jolin, Lake Park, secretary.

At a largely attended meeting of the members of the District Medical Society held at Madison, S. D., recently, officers for the 1934 season were named as follows: Dr. E. W. Goldman, Madison, president; Dr. H. A. Miller, Brookings, vice-president, and Dr. R. K. Miller, Madison, secretary.

Dr. J. A. Myers, Minneapolis, had his time well occupied last month, when he visited and made addresses before state and society meetings at the following cities: December 6, Columbia, Mo.; December 7, Chicago, Ill.; December 8, Cleveland, Ohio; December 15, Springfield, Ill., and December 28, Chicago, Ill.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota, is the speaker. The program for the month of January will be as follows: January 3, "What Price Health?"; January 10, "Little's Disease"; January 17, "First Aid in Poisoning"; January 24, "Mental Health in Childhood"; January 31, "Jaw Tumors."

A meeting of the Sixth District Medical Society was held on December 2 at Bismarck. A large attendance of members were present. Dinner was served, after which the entire evening was given over to a discussion of the program sponsored by the Committee on Medical Economics of the State Medical Association. The Society went on record as unanimously approving the program, and established a permanent committee on medical economics to develop the necessary machinery in the county which acts at the meetings of the various Boards of County Commissioners in the district. The following officers were elected for 1934: President, Dr. M. W. Roan, Bismarck; Vice-president, Dr. W. C. Wolverton, Linton, and Secretary-treasurer, Dr. L. W. Larson, Bismarck.

The regular annual meeting of the Yankton District Medical Society was held on December 14. The regular business and scientific program followed immediately the dinner. The following officers were elected: President, Dr. Thos. Cruickshank, Vermillion; Vice-president, Dr. F. J. Abts, Yankton, and Secretary, Dr. J. A. Hohf, Yankton. Dr. S. W. Harrington of Rochester spoke from notes and lantern slides upon the subject of "Cancer of the Breast." It was the consensus of opinion of all present that his talk was a complete and masterly presentation of the subject. Dr. G. E. Johnson of Yankton reported on two cases of carcinoma, one of the lung and the other of the splenic flexure of the colon. X-rays of each of these cases were also shown. The medical student body of Vermillion was in attendance.

Mrs. Jackson Mitchell, 63 years of age, of Hokah, Minn., has been convicted by a jury of the crime of manslaughter in the first degree. Judge Vernon Gates of Rochester, who presided at the trial, sentenced the defendant to an indeterminate term in the Women's Reformatory at Shakopee. The sentence is for five to 20 years as provided by law. The defendant was arrested on a complaint signed by the father of a 22-year-old Winona county girl whose death occurred from peritonitis and general septicemia following the performance of a criminal abortion. Mrs. Mitchell testified that she did not perform the abortion, but admitted that the girl was there at her place for that purpose. The defendant also testified that for 30 or 40 years she had done practical nursing and midwifery in Houston county, but was neither a registered nurse nor a licensed midwife.

The Sioux Valley Medical Association will hold its thirty-seventh annual session in Sioux City, Iowa, on January 23 and 24, 1934, under the presidency of Dr. S. A. Slater, Worthington, Minn. The program will consist of papers and clinical demonstrations covering a wide variety of subjects, participated in by Drs. C. M. McKenna and F. H. Falls, Chicago; P. C. Jeans, Iowa City; R. D. Schrock, Omaha; S. Marx White and O. H. Wangensteen, Minneapolis, and A. W. Adson and A. C. Davis, Rochester, Minn. The guest speaker at the banquet on the evening of January 23 will be Dr. Gilbert Cottam, Minneapolis, one of the organizers of the association in 1896 and a member of the Editorial Board of THE JOURNAL-LANCET. The complete program will be published in the next issue of THE JOURNAL-LANCET, which is the official organ of the organization. Dr. Roscoe Jepson, Sioux City, Iowa, is the secretary.

The JOURNAL LANCET

Minneapolis, Minnesota
January 15, 1934

New Series
Vol. LIV, No. 2

Amoebic Dysentery: A Review of Recent Reports on Therapy

C. A. McKinlay, M.D.
Minneapolis

THE REPORT by Ikeda[1] of the very thorough clinical and laboratory work leading to the detection of cases of amœbic dysentery in one hospital in this area is an approach to the problem of treatment of this disease, the responsibility of which falls upon the practitioner. While it is true that probably only isolated cases will occur in individual practices, safe and effective measures should be promptly available. Indeed, a crucial factor in combating the spread of the disease from foci set up by the present epidemic is the prompt effective treatment in each individual case, with, therefore, lessened incidence of complications, chronicity, and number of carriers. Craig,[2] who speaks with the authority of wide experience with amœbiasis, stresses treating all such infection even though the host is largely symptom-free.

In an attempt briefly to survey recent and authoritative literature on treatment of amœbic dysentery, it is forcibly brought to mind that not yet has specific therapeutic procedure, comparable in effectiveness, for instance, to the use of quinine in malaria, become available. The use of emetine, mentioned first in many texts and recommended by such experienced observers as Craig, is subject to critical survey. In addition to clinical reports such as that of Leibly[3] of fatal emetine poisoning due to cumulative action, reports on the pathology of amœbic dysentery, Rinehart and Anderson,[4] show that the heart muscle bears the burden of the toxic effect of emetine. Lethal or sub-lethal doses of emetine hydrochloride in rabbits caused severe injury to the heart muscle. They call attention to the similarity of the lesion with the Aschoff reaction in acute rheumatic fever. In a survey of the chemotherapy of amœbiasis, Leake[5] states that the ipecac alkaloids are too dangerous in effective dosage. While in the acute phases of the disease emetine may be given, its total dosage should not exceed 10 grains in the average human adult according to Vedder.[6] Other observers would limit this to 8 or 9 grains. Only in amœbic hepatitis or liver abscess does emetine remain the drug of choice according to several observers on the Pacific coast.

Reed, Anderson, David, and Leake[7] report that more closely than any other drug now exploited does carbarsone (4-carbamino-phenylarsonic acid containing 28.8 per cent of arsenic) meet the requirement of an ideal anti-amœbic agent, in that it is chemically non-toxic in effective doses. They used for the average adult 0.25 gm. daily for ten days given in gelatin capsules by mouth. It should not be used in amœbic hepatisis. The arsenic in carbarsone is not rapidly eliminated and care should be exercised not to induce arsenic toxicity. They suggest repetition of the course after a ten-day rest period if the stools fail to clear. David, Johnstone, and Stanley[8] report that all but one of a group of 42 cases of amœbiasis observed for three or four months after oral ambulatory treatment

with carbarsone were cleared of the parasites capsules by mouth. It should not be used in without toxic effect. Excellent results from the use of stovarsol and acetarsone have been noted, although toxic effects have been reported by Bender[9] and Michael[10] respectively.

Chiniofon ("Anayodin" and "Yatren"), prominently mentioned in another clinical group of drugs, is iodohydroxyquinoline. Reed and Leake[11] used a related drug, iodochlorhydroxyquinoline (vioform NNR), 15 gm. orally in one month. They gave 0.75 gm. daily in divided doses for ten days, rested one week and repeated the course. In 39 out of 47 cases the stools were cleared over a four months' period after treatment. There was a recurrence of the parasites in five, but eradication was noted after repetition. Three severe cases remained not cleared. This drug should not be given rectally because of local irritation.

In contrast with the Pacific coast reports of the effectiveness of the arsenicals such as carbarsone and iodin-containing drugs such as vioform comes the report of James and Deeks[12] from their large experience with intestinal amœbiasis in the Canal Zone. They commonly combine emetine hydrochloride with bismuth. They are of the opinion that emetine acts as a direct poison to the endamœbas in the tissues; that no drug in their experience gives such brilliant results; that, however, it is not entirely efficacious in the chronic forms of the disease; that emetine must always be used carefully and never when surgical intervention is under consideration except in urgent cases. They stress in treatment of acute stages the value of bismuth subnitrate in heroic dosage. They give about 180 grains suspended in a tumbler of water or milk every three hours, lessening the amount only when improvement occurs. Deeks[13] in 1928 reaffirms the value of treatment with bismuth and emetine and states that the newer measures with bismuth-emetine-iodide, yatren and stovarsol have not given such good results.

Lynch[14] gives a routine in treatment of active amœbic colitis in part as follows: bed rest with liquid diet preferably with emetine hydrochloride hypodermically, 1 grain daily for 9 to 10 days; bismuth subnitrate as mentioned by Deeks in heroic dosage. Rectal irrigations are unnecessary.

Brown,[15] of the Mayo Clinic, in stating his procedure in the acute phases of the disease, uses emetine hydrochloride subcutaneously in concentrated dosage, 6 or 7 grains in divided dosage, within three days followed by a rest period. Use "treparsol in tablets of 0.25 gm. with each of the three meals for four days and repeat for two more such courses, allowing a ten-day period of rest between courses. Administration of treparsol and emetine is started at the same time." Because of the fact that peripheral neuritis follows the continued use of both emetine and arsenic in the resistent cases, a change to one of the iodin containing drugs may be made. Yatren 3 gm., is given in divided doses daily for a week, and this treatment is repeated after an interval of a week, or vioform is given by mouth, 0.75 gm. in divided doses each day for ten days. Yatren or vioform may cause diarrhea but no other complications. After two courses of emetine and three of treparsol, stools are examined for three days and, if negative, at the end of a month and also after two or three more months.

The acuteness of the present epidemic emphasizes that there is considerable variation in the severity of the epidemic, varying with time and place, due possibly to the change of virulence of the parasite. The more acute fulminating types as seen in the South and the Canal Zone may account for the emphasis on emetine therapy there, while the less intense carrier phases seen on the Pacific coast emphasize the value of arsenicals.

Certain points of emphasis are worthy of note. Only after the Endamœba histolytica has been isolated from the stool should specific drug therapy be started. Then the physician must steer a course between the Scylla of therapy too safe to be effective and the Charybdis of therapy that destroys, not only, the parasite but the host as well. It appears that emetine has its place in the acute phases of amœbic dysentery, but that the total course dosage should not exceed 9 to 10 grains.

Carbarsone appears to give fewer toxic reactions than other arsenicals. As any arsenical, it should be used cautiously and in view of possible neuritis and dermatitis. Vioform appears to be an effective form of the iodin-containing drugs suitable for oral administration.

With any treatment, only after repeated negative stools have been found over a period of some months should the infected individual be considered safe for himself and for society.

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(*Continued on Page 27.*)

Medical Aspect of Angina Pectoris*

Donald McCarthy, M.D.
Minneapolis

THE symptom complex commonly termed angina pectoris was first described by Heberden[1] in 1768 at a lecture before the Royal College of Physicians in London and was later published in their transactions under the title of "Some Account of a Disorder of the Breast."

Heberden also wrote a chapter entitled "Pectoris Dolor," in "Commentaries on the History and Cure of Diseases," which was translated by his son and published in London in 1802. In the course of the chapter Heberden has given an excellent clinical picture of the disease and of his observations of patients suffering from it. Although two and one-half centuries have passed since this description was first written but little has been added in describing the disease.

The diagnosis must rest entirely upon the history as elucidated by the physician except in those comparatively rare instances in which the physician may be present during the attack. The chief characteristic as emphasized by White[2] in a paper recently given before the American College of Physicians is a profound sense of oppression in the thorax usually under the upper or mid sternum brought on by exertion or excitement persisting a few minutes and frequently radiating to the arms. This sense of oppression may vary from the very mild to the extremely severe in which the chest is described as feeling as though in a giant vise. The radiation of pain is decidedly variable. There may be no radiation and the area of oppression be narrowly localized under the sternum. Most cases, however, do show some radiation toward the arm, the left arm being the most commonly affected, although radiation to both arms may occur and the right arm alone may occasionally be affected. The pain may also radiate to the neck, the jaw and face. In addition to the sense of oppression most writers refer to a sense of impending death although White in the article previously referred to states that such has not been his experience.

The onset of the attack is always abrupt and as a rule the patient is able to assign some definite cause for it such as exertion, excitement, over-eating, chilling, etc. Many patients have attacks following certain combination of events as for example if soon after a meal they walk or make brisk movements. Another rather common combination is walking when it is cold or against the wind. Other precipitating causes are anger, fear and excitement. Straining at stool or sexual intercourse are frequently mentioned. At times, however, no such causes exist and in fact attacks may come on during sleep awaking the patient. This type has been described by Vaquez under the name of "Angina of Rest."

The duration of the attack is brief. It may last only a few seconds, or it may last as long as half an hour but the usual duration is not over two to three minutes and stops with rest shortly after the exertion or excitement is discontinued. The symptom complex is as a rule often repeated, recurring whenever there is sufficient strain which may be several times an hour or but once a year. It may recur for many years with little change in frequency or there may be free intervals of days, weeks or months between periods of attacks.

The differential diagnosis is usually not confusing. Coronary thrombosis is characterized by exactly the same type of pain. It is, however, much more prolonged lasting hours instead of minutes. The pain is usually, though not always, even more severe. Aortic pain probably occurs only when the aortic wall is seriously involved. It consists of a prolonged heavy ache sometimes likened to a throbbing toothache commonly located in the upper sternum and base of the neck especially to the right of the midline often radiating to the right arm and shoulder.

Disease processes affecting the structures of the thoracic wall such as arthritis and bursitis are usually easily differentiated by their location in other than the substernal region, the aching character and prolonged duration and aggravation by certain movements of the thorax or arm. Peptic ulcer, gall bladder disease and gaseous distension of the stomach and colon may all give confusing symptoms but can usually be easily differentiated by history and the general course of the condition. It must, however, be remembered that any of these last three may also be present in the same patient with coronary disease and in fact the association especially of gall bladder disease and coronary

*Given before the Minneapolis Clinical Club as part of symposium on angina pectoris November 9, 1933.

disease is not infrequent. Neurocirculatory asthenia must also be differentiated.

The course of the disease naturally is extremely variable—some have mild short attacks over a period of many years and eventually die of noncardiac causes. Others are much more severe with frequent prolonged attacks not infrequently culminating in coronary thrombosis. The prognosis must vary with the amount of organic heart disease which is present. The frequency and severity of attacks—the ease of onset and ease of relief as well, and not least important the nervous state of the patient must be taken into consideration for it must be remembered that it takes a much lesser stimulus to cause pain in a sensitive or extremely nervous individual than in one habitually lethargic and placid. The average length of life after appearance of symptoms is stated to have been 5.4 years by MacKenzie[3] in a series of 213 patients and White[4] states that from a series of 500 cases seen in private practice 212 had died with an average life of 4.6 years and that 268 of the remaining 288 have been traced as alive with an average duration at that time of 5.1 years.

Treatment

This naturally divides itself into three divisions —first the prophylactic, second the treatment of the attack and third the treatment between attacks. Concerning prophylaxis, much or little may be said according to the inclination—certain it is that the number of those affected with the disease is markedly increasing and that it represents to varying degrees the inability of the physical and nervous mechanism to stand up under the present strain of modern life as we all see it. It is significant that it is said to be rarely seen in the tropics. The Negro rarely has the condition. It may be that as a race we will eventually learn to slacken the pace at which we live, but such progress if it comes must be for future generations as I have very little hope for our own along this line.

The treatment of the attack itself consists primarily in the administration of nitrites. These may be given in any of several forms. Amyl nitrite was first introduced by Lauder Brunton[5] In 1867 and is inhaled from a small ampoule broken at the moment needed. Nitroglycerin was introduced by Murrell[6] in 1867 and is best taken in the form of a quickly soluble tablet crushed and held in the mouth. These two preparations are the most effective in the treatment of the actual attack. Sodium nitrite and erythrol tetranitrate are less prompt in their action but have a more lasting effect and are most useful in prevention of attacks rather than in treatment of the attack itself due to their more prolonged action. Wallace and Ringer[7] in 1909 studied the time of action of the various members of this group with relation to the production of a fall in blood pressure and the duration of this effect. These results are tabulated as follows:

TABLE I

THE SPEED AND DURATION OF ACTION OF VARIOUS NITRITE DRUGS

Preparation	*Speed of Action*	*Duration of Effect*
Amyl nitrite	A few seconds (10)	A few minutes (10)
Nitroglycerine	1 to 2 minutes	30 minutes to 1 hour
Sodium nitrite	5 to 10 minutes	1 hour to 2 hours
Erythrol tetranitrate	15 minutes	3 hours
Mannitol hexanitrate or pentanitrate	30 minutes	4 to 5 hours

The question of acquired tolerance for this type of drug has also been studied by Crandall, Leake. Loevenhart and Muehlberger[8] of Wisconsin. These results show definitely that tolerance is acquired especially to nitroglycerine.

TABLE II

(Crandall, Leake, Loevenhart and Muehlberger)

TIME REQUIRED FOR PRODUCTION OF TOLERANCE TO HEADACHE EFFECTS OF ONE HEADACHE DOSE

Substance	*Route*	*Total Time Hours*
Sodium nitrite	Oral	No tolerance
Erythrol tetranitrate	Oral	60
Glyceryl trinitrate	Skin absorption	38
Ethylene glycol dinitrate	Skin absorption	32
Methyl nitrate	Inhalation	24
Amyl nitrite	Inhalation	2-3

TABLE III

(Crandall, Leake, Loevenhart and Muehlberger)

AMOUNTS OF "NITRITES" REQUIRED FOR PRODUCTION OF TOLERANCE TO HEADACHE EFFECTS OF ONE HEADACHE DOSE CALCULATED ON THE BASIS OF ONE HEADACHE DOSE GLYCERYL TRINITRATE = 10 MGM.

Substance	*Route*	*Amount mgm.*
Sodium nitrite	Oral	No tolerance
Erythrol tetranitrate	Oral	216
Glyceryl trinitrate	Skin absorption	52
Ethylene glycol dinitrate	Skin absorption	160
Methyl nitrate	Inhalation	Not measured
Amyl nitrite	Inhalation	102

Morphine, while having a much slower action, is of great value especially in the more nervous and highly sensitized individual. Alcohol has been used since the days of Heberden. While its use is largely impirical, however, the fact that it is of definite value is attested by many patients. In considering the question of treatment other than in the acute attacks—rest must be most prominently featured. To what extent this is necessary must of course depend upon the individual case but certainly every case in whom the symptom complex appears needs more rest than he has been having. In mild cases a period of recumbency after meals may suffice but if symptoms persist, rest must be much more extensive varying from the week-end in bed to complete bed rest for six to eight weeks in the more severe cases. This disease resembles diabetes in the respect that the

individual has a definite threshold or tolerance limit and further that by care the threshold or tolerance may be considerably improved. The régime for each case must, of course, be determined individually. In the consideration of rest, it must be remembered that mental and nervous factors are just as important as physical ones. Rest is usually much more complete away from home and under surroundings which eliminate domestic and business worries to the greatest extent. When the patient is allowed to be up and about he must be cautioned against the factors which experience has shown are likely to produce an attack such as exercise after meals, or in the cold, hill climbing, etc. Fishing for many is ideal. Whether golf is to be permitted depends of course upon the physical tolerance of the individual.

Concerning drug therapy between attacks the theobromin group especially euphyllin have been widely used for their effect as coronary dilators. While it is questionable that this is the mode of improvement, clinical experience has shown these drugs to be of definite benefit.

Simple sedatives such as phenobarbital and the bromides are definitely useful in allaying the over excitability and nervousness of certain types of individuals.

Digitalis and drugs of the allied types are of little or no use unless the heart condition itself presents definite indications in which case they may be of marked value. The value, however, lies in the restoration of compensation and function rather than in any effect upon the symptom complex itself.

Mild massage, hydrotherapy and heliotherapy are all of value in the management of those who are able to afford these luxuries. Their value, however, lies chiefly in promoting the system's well being rather than in any direct effect.

In conclusion may I stress the fact that the treatment of the patient with angina, must include much more than a routine giving of nitrites, alcohol or morphine. It must start with a painstaking and accurate general examination as well as the examination of the cardiovascular apparatus. It must include the treatment of any other factors which may be depressing the individual's condition of health with due regard to care, however, in eradication of foci such as teeth, tonsils, infected sinuses, etc. It must include the estimation of the patient's reaction to various physical and nervous stimulus and the study of the patient as an individual with individual characteristics rather than a study merely as a cardiac case. Finally it must provide a careful, watchful observation of the patient with a view to advising him from time to time of advisable changes in habits, periods of rest, etc., the object being to have the patient derive the utmost in usefulness from his physical machine while at the same time conserving his heart as may be needed in his particular case.

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Goiter Prophylaxis

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THOSE of us who live in the Upper Mississippi Valley and Great Lakes Basin are constantly aware of the need for a practical and effective method of controlling and preventing simple goiter.[1]

As surgeons, we know that surgery of the thyroid has progressed to the point where, in experienced hands, the mortality rate is very low, being only a fraction of one per cent. Obviously, from now on the safety and well-being of our patients, due to improved techinque, management, etc., can improve only by a small fraction of one per cent. While we should continue every effort to improve our surgery it seems to me that it is also our duty to disseminate what reliable information we have concerning the prophylaxis of goiter.

It is true that there are factors and possibly a specific cause underlying goiter that we do not understand. These causes vary in intensity in the same and different localities, appearing in a wave-like manner quite beyond us.[2] However, we should realize and accept this one fact: That a lack of sufficient available iodine in foods and fluids is the largest single factor known in endemic goiter. Chatin did some outstanding work along this line about 1850 and in 1852, the Paris Academy of Sciences appointed a commission which verified his work. Research work in goiterous regions in Canada, the United States, the Scandanavian Peninsula[3], Switzerland and other countries would seem to confirm this statement. The results obtained from many factual studies indicate that there is definitely less iodine in the foods and fluids consumed by people in goiterous regions than there is in the foods of non-goiterous sections.

Successful experimental measures have been employed in various localities. Minute doses of iodine in the form of iodized salt, and iodized sweets have been given with beneficial results, especially to children. The work of Fraser,[4] Kimball,[5] Marine,[6,20] and others has been reported and so widely read that further comment would seem out of place except to give credit.

It appears to be Fraser's belief that iodized salt is of the most benefit when used by the normal or apparently normal individual when living in a locality where the ingestion of iodine is below normal.

I wish at this point to reiterate, at the cost of tiring some readers, the value and need of iodine in normal amounts in the human body for its general well-being.

1. It is essential to effective metabolism, respiratory functioning and physical growth.
2. It is necessary for mental development.
3. It is especially required in the pregnant condition, in the interest of both mother and child.
4. It is needed at the age of adolescence for the development of the reproductive organs.
5. It is essential to the health of the skin, hair and the like.
6. It is necessary for the metabolism of calcium, excess limes demanding additional iodine for its proper assimilation.
7. It is needed to establish and maintain resistance to bacterial infection and toxines.[7] The problem is how best to supply this need. Minute doses of inorganic iodine has been suggested and widely used, iodized salt being the most common agent.

Concerning the strength of iodized salt that should be used there is much difference of opinion and usage. It varies from 1 to 5,000 in the U. S.; 1 to 10,000 in Canada; 1 to 200,000 in Switzerland, and so on to 1 to 250,000 in New Zealand.[19] This probably is as it should be in that the object is to supply the deficiency in the various localities. It must also be remembered that there is probably a marked difference in individual abilty to make available to the physical economy the needed iodine from the inorganic element ingested. Some workers in this field (e. g. Oleson) have little confidence in benefits from Iodized Salt.[8]

Gortner advises giving iodine in milk, 3, 4, or 5 drops per dose after standing at least twelve minutes. Thus we have *some* variance of opinion among the medical profession not only as to the value of minute doses of inorganic iodine but also as to the minuteness of doses. The preponderance of opinion and experiment, however, is in favor of the iodized salt. In my opinion, the good resulting from the use of iodized salt has been and will be immeasurably greater than the harm. The use of iodine in appreciable doses

is a different matter and should not be countenanced by the profession except on the advice of a physician.[21] Iodine is an inorganic mineral and potent remedy. We hear and read a great deal about the alleged dangers resulting from its use. Particular mention is made of the risk of inducing symptoms of hyperthyroidism in normal individuals, or in simple cases of goiter, and the peril of increasing such symptoms when hyperthyroidism is already present. Both Fraser and Brewer[9] report only a minimum of adverse results, but Fraser states that "we cannot say that adverse results never follow iodine administration."

Faced with these opinions concerning the administration of iodine and knowing the danger of the indiscriminate use of iodine in its inorganic form, what useful and practical advice can we offer, in our professional capacity to the people living in the "danger zone?"[10]

I believe that a mineral balance with reference to iodine in the diet of those residing in the goiterous areas can be established and maintained.[11] After giving the problem careful thought and study extending over a period of years, I am convinced that Dr. J. F. McClendon's suggestion of more sea food in the diet is the solution.

Authorities have long recognized the importance of marine food as a purveyor of iodine to man. Radcliffe[12] states that marine food, notably lobsters, oysters and clams, has two hundred times as much iodine as milk, eggs, or beefsteak. Shrimp contains one hundred times as much, and most other sea foods fifty times as much. Wells[13] states that if people would use marine fish or shell fish in their diet, two or three times each week the amount of iodine ingested would be increased and a reduction in the number of goiters and other thyroid disorders would result. As for the safety of such a procedure, let me quote from a paper by Weston[14]: "After a most diligent and careful search of the literature I have failed to find a single incidence of iodine poisoning where the diet contains an enormous amount iodine in its organic state." It is worthy of note in this connection that the Japanese among whom goiter is practically unknown, consume a great deal of kelp or sea weed in their daily diet.

With these facts in mind, I have endeavored to tabulate in an accessible and practical form, based on the extensive analyses of McClendon, Remington, U. S. Biochemists, and others, the various values of sea foods in comparison with other items of the diet in Iodine content.

Table I. The figures given show the number of parts per billion (P. P. B.) of iodine in analyses on fresh foods.

IODINE CONTENT—SALT WATER FISH
Parts Per Billion—Fresh

Lobster	1,380
Clams	1,370
Oysters	1,160
Smoked Sea Herring	1,800
Sardines (best)	600
Shrimp	450
Crabs	450
Blue Fish	260
Spanish Mackerel	400
Cod, about	300
Halibut	250
Tuna, about	200
Salmon	200

IODINE CONTENT—FRESH WATER FISH
Parts Per Billion—Fresh

White Fish	11
Bass, Large Mouth Black Miss.	10
Pickerel	20
Perch	20

IODINE CONTENT—MEATS AND DAIRY PRODUCTS
Parts Per Billion

Beef, average	5
Veal	22
Butter	106
Milk	5
Eggs	27

It is an established fact that the iodine content of potatoes and other vegetables varies with the locality in which they are grown.[15] South Carolina and other Coast States products yield greater iodine content than produce of the same type grown in Upper Mississippi, Great Lakes Basin, Oregon and California.[16]

In these tables it is not presumed to show the exact iodine values of foods at all times or in all localities. The iodine content of sea foods vary somewhat with the seasons and place of taking. The same may be said of vegetables. The Iodine content of both animal and vegetable is generally higher in summer and fall, due perhaps to the effect of the sun.[17] Among the vegetables the tops or leafy ones and portions above the ground appear to contain the most iodine. The potato seems to be the exception to the rule. Records of analyses of vegetables in Minnesota, except the potato, have not been found, so have used figures in comparable localities, Michigan, Oregon and California. McClendon[22] has shown from a number of samples Minnesota potatoes average iodine values less than one-half of that which Remington reports in potatoes produced in South Carolina. The differences in the leafy vegetable content of iodine of the two areas appear to be greater.

Table II. Showing how the proper amount of Iodine may be included in the daily ration in Minnesota.

AMOUNT OF FOOD NECESSARY TO FURNISH .01 MG. IODINE PER DAY

Group I—		
Lobster Clams Oysters Sea Herring (Smoked)	.....	⅓ oz. daily or about 3½ oz. per week

Group II—	
Shrimp, Sardines, Crabs	⅔ oz. daily or about 5 oz. per week
Group III—	
Mackerel, Cod, Tuna, Salmon, etc.	10 oz. per week
Potatoes	8-10 oz. daily
Spinach	7 lbs. daily
Stringbeans	7 lbs. daily
Lettuce	7 lbs. daily
Cabbage	7 lbs. daily
Butter	3 oz. daily
Eggs	2.7 lbs. daily
Beef	8-8 lbs. daily

The above table is an attempt to show quickly the relative iodine value of foods with suggestions as the amounts necessary to make them of practical value in general usage. By establishing the mineral balance in foods with special reference to iodine in this way we can escape from any harm or uncertainty that may attend the use of the inorganic element in salt or otherwise. It is nature's method. It is generally conceded that the average individual should have about .01 mg. of *iodine per day* to maintain the iodine balance. This recommended amount of iodine in foods may be more than enough, but safety lies in being sure of having enough, since there is no danger in more than really nesessary. The sea foods are arranged in three groups, group two, having one-half the value of group one and group three, one-half the value of group two. It has been my habit to advise two meals per week with one at least from the two upper groups. It is worth noting that the sea foods may be either canned or fresh and that the mode of preparation can be left to the individual taste without interfering with the iodine content.

The grains of the Northwest Untied States and Canada are notably low in iodine content. Wheat varies from one to six P. P. B., while oats contains about ten P. P. B. White flour contains about 3.5 P. P. B., and shorts about 9. 6 P. P. B. No analyses have been found showing the iodine content of corn grown in the upper Mississippi region, but it must of necessity be low. Hence the breads and cereals produced from these grains and corn must be almost negative in value so far as iodine is concerned.

The practical question of food costs and availability is always with us. Concerning these problems the reader is referred to the U. S. pamphlet on "Nutritive Value of Fish and Shellfish." Sea foods canned or preserved in salt may be obtained at any time in almost every locality from local dealers. There are also several sea food companies that sell direct to consumers, making them available everywhere. The cost per unit of energy compares very favorably with that of the usual flesh foods. Even lobster, canned, may be served on the ordinary table at about the same cost as beef steak.

Many of us do not like sea foods simply because we have not been accustomed to them. The "taste" is readily acquired, especially in children.

At this point it is a fair question to ask what about the nutrient value of sea foods. In fats and proteids they compare very favorable with our own common flesh foods. In carbohydrate value they are lower, but contain enough for a well-balanced diet. The amino acids are all present except glycine and this supplied by the splitting of other amino acids. As to vitamins, fortunately, most of our ordinary foods contain at least small amounts of one or more of them, so that where we eat a fairly wide variety of natural foods the danger of vitamin deficiency is small, except in the case of a single one viz., vitamin D.[18] Sea foods are especially rich in vitamin D, which has to do with bony development. It is interesting to note that the bodies of mammals such as cattle, hogs are entirely lacking or very poor in Vitamin D. Foods from the sea are available the year round either canned or salted at prices comparable to other foods. One exception should be made in the sea foods as to the iodine content. viz., Lute Fisk. The Codfish whose oil contains 5,000 parts of iodine per billion, somewhere or sometime during its processing into Lute Fisk loses most all of this element.

Believing with McClendon and Marine that simple goiter is "the easiest known disease to prevent" and convinced of the general importance of iodine to the human body, it appears that we have a professional obligation to our fellowmen. Certainly it is our duty to bring to the people of the goiterous areas the knowledge of the benefits obtainable by preventive measures. Only by a widespread use of the measures advocated, followed by a careful and complete check-up, can we ever hope to combat successfully, the disease known as goiter.

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Iodine in Medicine*

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THE great need for ammunition moved the Acadime Francaise to set out prizes for the best possible methods of manufacture of salt-petre at the end of the 18th and beginning of the 19th centuries. The continental blockade, limiting imports, intensified the situation. The salt-petre cookers had a prosperous time, and enormous quantities of sea weed were treated.

On December 2, 1813 Le Moniteur Universel reported a session of the Institut Imperial. It related that Bernard Courtois, a manufacturer of salt-petre, had discovered in the ashes of Kelp and other similar weeds a new substance, which evaporated with a purple color and which the reporting men could not place. The matter appeared in scientific papers; Gay Lussac reported quite extensively and suggested the name "Iod." H. Davy, an English chemist, also called the new substance "iodine," both names signifying purple color. German essays appeared in 1814 and slowly the "substance nouvelle" attracted more workers and became better known. With 1815 the blockade lifted and the salt-petre boom deflated.

Courtois had little profit from his discovery. Some seven years before his death he received 7,000 Fr. from the Academie. The iodine was of little practical use, though it continued to occupy the scientists. In December 1819, Dr. C. J. Straub of Hofwyl, near Berne, published an article in which he expressed the desire to interest other physicians in administering iodine, as iodide of soda or of calcium, for the cure of goitre. He had isolated it from burnt sponge and was surprised that it had remained unobserved so far. Coindet's reports upon his successes with iodine therapy of goiter appeared in July 1820. Small wonder that the medical men of all Europe became aroused to enthusiasm, when they believed that a cure of a disease which was a national calamity had been found. What was a creek grew to a river, a great mass of literature appeared, not only medical men but physiologists, pharmacologists and chemists illuminated phases of the subject iodine. Among the first, Formey of Berlin, Dorvault, Boinet, and Chatin should be mentioned.

*Presented before the Minnesota Acadamy of Medicine, April, 1933.

Iodine of an atomic weight of 127 is the heaviest of the halogens. Its vapor tension is so great that on being freed in nature it scarcely occurs in any other but in gas form. Vaporizing at ordinary temperatures it has the greatest gas specific gravity of all elements; it is 8.5 times heavier than air. Its solubility in water is 0.2 in 1,000, but the solution is not stable. When the vessel is left open, iodine disappears into the free atmosphere, not the slightest trace remaining. It is highly active chemically. It changes to hydriodic acid which in turn oxidizes back to iodine with great facility, so that a lively mutation occurs between the element and its hydracid, a property the other halogens lack. This instability or lability of character insures for it an extremely active circulation. Iodine evinces a strong affinity to organic substances. It is far more difficult to separate it from its organic than from its inorganic combinations. The organic compound must be radically changed, as by digestion or disintegration or other thoroughgoing process, to convert the element into its inorganic form.

We may imagine that iodine was universally mixed with the fluid Earth-Magma. Every kind of rock contains iodine firmly locked up, and the rock is therefore the principal lager and source of it. Rendered soluble by erosion and subsequent hydration it has wandered abundantly into the sea. Sea levels of former epochs have risen, sediment has become stone which may contain more iodine than the rock it came from originally. The formation in which it occurs, soluble or almost insoluble, has given rise to the widespread opinion, that seawater holds much more iodine than the solid earthcrust. A mud made of finely ground rock, mixed and shaken with 10 times its weight of water, to which cold hydrochloric or acetic acid solution had been added, tested 200 times more iodine, than it did without the acids. It is because of the available iodine that water plants, compared to land grown vegetables and grasses, contain from eight to 10 times more of it. The iodine of the seawater is relatively low, as the element is continually absorbed by the organisms of the sea. Sea weeds, algae, kelp, etc., form a filter, as it were, and transmit the soluble element principally in organic

form. From the plants it passes into the animals. Fishes store it partially in the oil of their livers, shells and the crustacae in their calcareous or horny structures, in organic or inorganic formation. By reason of these organisms sinking to the bottom much iodine is found in the sediments. Different localities may test greater or lesser quantities of iodine depending upon an abundance of scarcity of the organisms having been present.

Plants draw iodine not only from the soil but also from the air. Given equal conditions of weight and measure, the air close to the ground holds similar amounts of iodine as the water of inland lakes. At the altitude of the Mont-Blanc, von Fellenberg found only 0.8 per cent of the iodine present at sea level. It circulates almost entirely in the troposphere continually returning to the soil. On quiet, windless days, directly above the ground, nine times more iodine was found than at the height of human respiration, and much less on top of a tower. Strong winds, dew, rain and snow completely change these conditions. As iodine escapes from the soil, so it does from all kinds of water. Rain water after standing in the open air 30 days lost from 31 to 100 per cent of its iodine content, while the loss in seawater in 25 days was about six to eight per cent. The process depends chiefly upon the hydrogen ion concentration.

Natures iodine circulation begins with the rock, erosion liberates the element, a part combines with the eroded stone, another part passes into the air, the rest wanders by way of creeks and rivers into the lakes and finally into the sea. On the way some of it goes into the air, some of it is taken up by the fresh water plants and animals. Of whatever reaches the sea a part again passes into the air and a part into seaweeds which feed the animals. Disintegrating sea organisms, especially those thrown upon the shores, give up their iodine to the air and to the soil. The precipitated organisms enrich the sediment which in subsequent geological epochs set the circulation again in motion as happened from the original rock.

Man obtains his iodine in very small amounts from the air, drinking water, and stone, namely salt; his chief supply he draws from vegetable or animal food stuffs, the most rich in iodine among them being green vegetables, eggs, milk, fresh water plants and fish, and, finally, seafood, plant and animal. The elimination proceeds principally in the urine but also in the perspiration, nasal secretion and the feces. It passes to the soil or to the water and re-enters the cycle.

The effects of iodine are varied by its degree of concentration, state of combination, and dose; hence, under different circumstances it may prove corrosive, irritant, or only alterative. Taken in a single moderate dose, it appears in the urine in 30 minutes and may continue to be detected for nearly 24 hours.

Acute iodine poisoning is produced in man by a dose of four to six grains. A sense of constriction in the throat, gastritis with nausea and vomiting, severe pain and diarrhea are the outstanding symptoms, disappearing when the iodine is eliminated. Medicinal doses may cause similar signs accompanied by fever, restlessness, loss of sleep, etc. However, they are of rare occurrence. It is detected unerringly by starch, producing a deep blue color. The test is so delicate that it will indicate the presence of iodine in 450,000 times its weight of water. Not infrequent is a mild iodism characterized by pain in the region of the frontal sinuses with or without coryza, and sometimes soreness of the mucous membranes of the mouth and the throat and a mild ptyalism: or a papular eruption of the skin may be first manifestation of its constitutional action.

When the teachings of Coindet had spread and were universally applied to the extend that the people of the mountainous regions of France were compelled by law to take iodine, there appeared new terms, such as constitutional iodism (Rillier) and cachexia iodica (Roeser). They designated a state of nervousness, tachycardia, exophthalmos, cerebral excitation, loss of sleep, restlessness, etc., and emaciation with an abnormal appetite. The alpine goiter had proved sensitive to iodine and a veritable respect condensed to the historical "Horror iodi." In the presence of a functioning thyroid Kocher effected hyperthyroidism with iodine and later published his famous paper on Iodine-Basedow in 1898. In his opinion the two conditions, thyrotoxicosis and jod-Basedow, could not be distinguished, if the exciting cause was not known. A dilemmatic situation presented, they could not use Beelzebub to move kindred spirits, and so were deferred the blessings of the Lugol treatment of hyperthyroidism for many years, until Henry Plummer brought the change.

Iodine operates as a general stimulant of the vital actions, especially of the absorbent and glandular systems. The most eligible form for internal administration is its solution in water aided by potassium iodide. Doctor Lugol introduced the Liquor Iodi Compositus, (1.5, KI. 20, Aq. 100) and advised one-half grain of iodine, largely diluted, daily for two weeks, three-fourths grain for the second and third fortnight, and one grain during the fourth and fifth or one and

one-fourth grain for longer time. He employed it in glandular enlargements.

In conditions due to asymphony or dysfunction of the vegetative nervous system and the endocrines especially in menstrual disorders, iodine is still regarded of great value. It was used in liver diseases, in advanced syphilis and in scaly skin affections and chronic rheumatism. Chronic lead poisoning calls for it as a valuable remedy in good-sized doses. The tincture is not desirable for internal use, for, when freshly prepared, the iodine is precipitated from it by dilution with water, and as a consequence, the irritating solid iodine comes in contact with the gastric mucosa, after the dose has been swallowed. To maintain the system under continued influence of the element Boinet employed iodic alimentation, that is, he mixed it with food, as with bread or other farinaceous substances (Amylum iodatum). Iodine should not be dispensed in solution with an alkaloid, as it forms insoluble compounds which are not inert in the stomach.

Iodine may be applied externally to produce its peculiar constitutional impression. Baths containing three grains to the gallon, iodine ointment, or topically painting with the tincture, have been used. As a wash, Lugol's solution was applied to fistulous ulcers, scrofulous ophthalmia and ozoena. For local effect to act as a caustic or as an irritant, stronger preparations are employed. The rubefacient iodine solution (1.15, KI. 30, Aq 180) and (Tr. Iodi Fortior 1.170 Alk,—1,000) are applied as counteriritants. For the removal of naevi, the iodine paint (I 4, Alk. 30) was valued. Lugol's caustic iodine solution (1.30, KI. 30, Aq. 60) has been employed with decided benefit in lupus and for the destruction of soft and fungous granulations. Iodized glycerin (I. 1, Gly. 2) is another caustic solution formerly much favored in cases of lupus and syphilitic ulcers. In gynecological practice topical application of Iodine to vagina and uterus has been in vogue constantly for many years. When the thorough aseptic measures of pre-operative preparation grew irksome, the surgeon relapsed to antiseptics and so, for several decades careful painting with the Tr. of iodine, removing it with alcohol, has been in use almost universally. When resecting tuberculous joints Kocher covered the exposed surfaces with iodoform paste, cooked in bichloride solution.

Formerly iodine inhalations were administered in cases of phthisis and chronic bronchitis. It was injected into various cavities for the relief of pleuritic effusions, ascites, hydrocele and other affections. During the seventh and eighth decades of the last century it was the treatment par excellence of goiter. Luton, a prominent French surgeon, had such faith, that he was moved to publicly denounce surgical intervention. Kocher, however, demonstrated that he could produce the desired aseptic inflammatory reaction, effected by the injection, as well and safer with alcohol, and proved the overwhelming superiority of operative treatment. We have lived to see the glittering diagnostic evidence of organography from organic iodine componds injected in various ways.

Bauman's discovery of iodine in the thyroid tissue and Halsted's description of the histology of hyperplasia following lobectomies in dogs, which he could modify or prevent with iodine, had for immediate effect only renewed interest in the theory of iodine deficiency as the cause of goiter. However, some workers continued and succeeded in disclosing the biochemistry of iodine and its importanec to life. In the Freiburg laboratories iodothyrin (nine per cent I) was produced by hydrolysis, while searching for the active principle of the thyroid gland. Oswald demonstrated thyreoglobulin. This and the former are iodoalbumen compounds of varying biological values. Kendall isolated the crystaline thyroxin containing 65 per cent I. It proved to be the active principle of the thyroid. Harrington showed thyroxin to be a derivative of tyrosine; it is composed of two rings, diiodotyrosine and diiodohydroquinone. The fundamental experiments of Gudernatsch showing that thyroid tissue would accelerate and modify amphibian metamorphosis were continued and extended by Romeis and Blum, who used thyroxin as well. One one-hundredth part of a sheep thyroid in 300 cc. of water speeds the change in the tadpole distinctly, but the addition of 2 cc. of the sheep's blood neutralizes this potency of the thyroid. To balance the action of the entire gland in this sense, only 400 cc. of blood was necessary. If, therefore, a large animal had four quarts of blood it prossessed in it 10 times as much of the anti or* inhibiting agens, compared with the driving force of the thyroid. In the beginning the thought seemed not so far beside the mark, to employ the blood of thyroidectomized animals in the therapy of hyperthyroidism. However, it was found that the normal blood and the thyroidless blood had the same power and that the blood of patients with Basedow disease would stimulate the tadpole metamorphosis; a proof that their blood was lacking the normal anti-thyroid factor. Accordingly Blum construed a protective diet, which, though meatless, contained a great deal of blood in practical form. (Haemokrinin). With this treat-

ment he has not had any failures, and he raises the question if the cause in certain forms of goiter might not be seen in the vanishing antithyroidal potency of the blood.* Further studies disclosed that in the quantities thyroxin was effective in abnormally changing the tadpole, diiodohydroquinone was responsible almost entirely. In sequence Blum was enabled to show that normal blood could detoxicate or neutralize diiodohydroquinone as well as thyroxin, in otherwise lethal doses. However, to raise the metabolic rate diiodohydroquinone failed in doses that made thyroxin effective. To check the abnormal influence of the thyroid hormone Abelin composed a diet of whole-grain bread, yolk of egg, bran, bonemarrow, fresh vegetables (especially cabbage), and uncooked fruit, but no potatoes. With this sort of feeding his thyroxin-treated animals failed to lose weight, there was no tachycardia, no nervous excitation, neither loss of hair nor exophthalmus nor any appreciable rise of metabolic rate. He applied his findings to the treatment of hyperthyroidism in man with considerable success, increasing the neutralizing factor in the circulating blood. However, not content with that side of the problem he attacked the thyroid at the same time. He surmised that a physiological balance between thyroxin and diiodothyrosine effect was essential to normal health, and that thyreo-toxic damage might ensue from a disproportion of both of these thyroid components. He found diiodothyrosine of great service both in animal artificial hyperthyroidism and in Graves disease. Kendall was the first to make reliable iodine tests of the blood; he found 13 microgm. equal 13 Gamma in 100 cc. of blood. He estimated the whole iodine content of the body to be 10 mg., von Fellenberg, who had continued the studies of Chatin was commissioned by the Swiss Health Board to make intensive studies of the iodine circulation in nature as well as in man. As his first step he developed a mikromethod permitting the showing of traces of iodine as slight as 0.1 Gamma equals 0.000,000.1 gm., requiring only 10 to 20 cc. of blood. Blum & Gruetzner and Sturm and Veil have since refined and further elaborated the tests, which in time may supersede the Basal ratings for diagnosis.

There exists in the blood an iodine level which is maintained as consistently as are those of albumen, sugar, or calcium. The normal is 12.8 Gamma with slight variations during different seasons of the year. The valency of different organs in the iodine economy varies. Most endocrines (Zondek divides them into vagus and sympathicus glands) and the spleen hold more iodine than the other organs of the body. It is significant that the active ovaries have a high iodine content in contrast to the resting ovaries in the Klimacterium. As to the form of iodine, Sturm & Veil found 65 per cent organic and 35 per cent inorganic. The blood iodine rises with changes of balance of the sympathetic and parasympathetic nervous system in favor of the sympathetic. The sympathetic in a state of excitation has hyperiodaemic effect like tachycardia and Basedow disease. Menstruation and pregnancy influence the blood iodine as well. In a normal patient there is a rise of 30 per cent or more on the first menstrual day compared with the 10th to 18th post menstrual day. The menstrual blood may contain from 70 to 100 Gamma per cent of iodine on the first or second day of menstruation (Jahn & Kessekaul). The periodically changing endosecretory activity of the ovaries dominated in part by the vagus and in part by the sympathetic, stimulating one or another hormone (iodine[2] compound) (Lipamine Luteslipoid) to rise, favors a peculiar liability of the vegetative nervous system in women and may easily effect an imbalance, when ovarian function ceases, and predispose to a thyreotoxicosis because of the relation to iodine. The iodine economy is most markedly influenced by changes in the thyroid gland. The cretin has a blood iodine level of from two to six Gamma in 100 cc. of blood, with a normal iodine elimination in his urine, while the hyperthyrectic patient, passing the same amount in his urine, has a level of from 25 to 70 Gamma per cent.

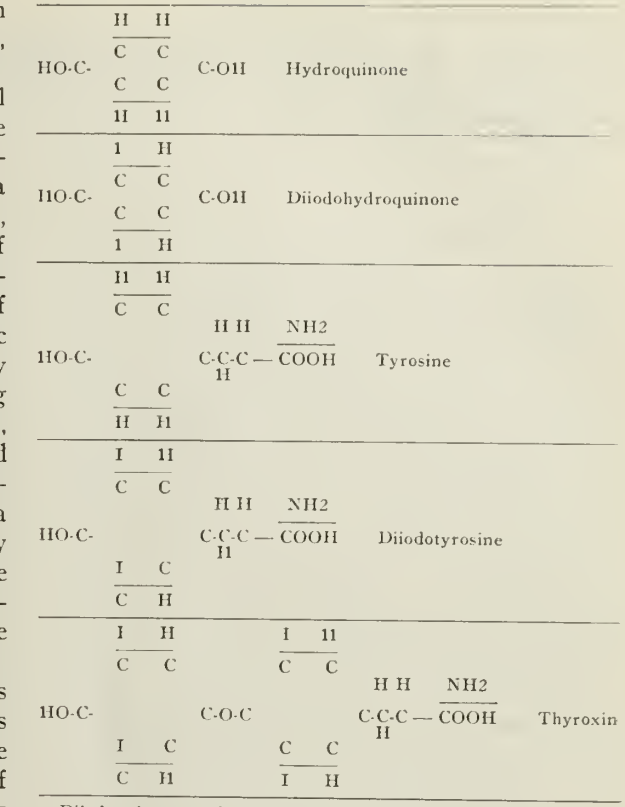
The alimentary influence upon the blood-iodine is slight (A. Sturm), the maintenance of its level is principally dependent upon endogenous factors. Sturm proved that the thyroid gland was the steering gear in the iodine metabolism. A few days after complete extirpation of the gland in dogs the blood-iodine dimished one-half. For 10 days the urine of the animals carried abnormal quantities of iodine, while a four-day fast stopped its elimination entirely, the fasting controls decreasing their iodine discharge only slightly. The alimentary influence upon the thyreodectomized dog's blood-iodine was marked, so that forfeiture of the thyroid gland proved to disrupt the regulatory mechanism of the iodine-metabolism. The thyroid receives more blood than any other organ except the lung. Tschuewsky tied his current-watch (Strom-Uhr) into the superior thyroid artery of a dog and thus measured the volume of the blood stream. Based upon his

*This protecting agens has of late been found by Blum (Katechin).

work a calculation has been made, that through a 100 gm. thyroid at 100 mm. mercury pressure, 565 cm. blood pass each minute.

It is assumed that a disturbance of the central nervous regulation of the iodine economy is the primary hypothesis for the development of hyperthyroidism. Relief of clinical symptoms of a thyreotoxicosis, and the sinking metabolic rate, are accompanied by a diminished proportion of the alcohol insoluble iodine compound (iodoalbumen) of the blood iodine. Administration of inorganic iodine effects diminution of the organic fraction of the blood iodine and hypersecretory thyroid can be changed to a secretion storing gland (Lunde, Closs, Holst, Breitner, Veil, Pedersen). Besides thyroxin, Harrington and Randall demonstrated in the thyroid the presence of diiodotyrosine. It is supposed that a quantitative proportioning of the organically bound iodine between thyroxin and diiodotyrosine may be a regulation factor not only for the functioning of the gland but for the activity of the thyroid incretion.

Alexander Sturm has published of late his work of perfusing artificially 42 living thyroids of dogs. For the first time it has been made possible, to observe the biological reactions of the thyroid gland and the mechanism of its secretory activity. It was shown conclusively that the thyroid secretes iodine. It is not discharged in a continuous manner but periods of rest alternate with secreting periods. The resting thyroid retains out of the arterial blood small amounts of iodine to create depots of organic iodine compounds. This phenomenon was made visible when the iodine level of the perfusing blood was artificially raised. Two factors are responsible to start the secretory activity. The sympathetic nervous system is the physiological provoking agent; handling the gland, or giving small doses of adrenalin (the medicinal stimulus of the sympathetic), induces secretion. On the other hand the gland responds as promptly and profusely if the concentration of the ionized iodine in the blood reaches a certain point. In the blood of dogs with normal thyroids the iodine level swings between 400 and 500 Gamma per cent; when that threshold stimulant has been exceeded the discharge sets in. The iodine comes forth in various chemical formations, the earliest



Diiodoquinone and Diiodotyrosine make Thyroxin.

to appear is the alcohol insoluble, iodoalbumen, which is regarded as the matured specific thyroid glandular product. When the secretory stimulus continues to rise through increased iodine concentration in the arterial blood, the chemical elements needed for the hormone pass on unused, and the thyroid emits iodine which is not albumen bound but ionized still. The thyroids of dogs fed iodine for days or weeks were found increasingly sensitive to blood iodine concentration, 300 Gamma per cent was their level. When thyroxin or other organic iodine was added to the perfusing blood there was no disturbance of the iodine balance but the viability of the tissue was reduced.

We have used diiodotyrosine for a year and find it at least equal to Lugol's solution. We have not been able to determine the proper dosage nor the length of time it may be used with best effect. We have obtained the material from Merck & Co.—Germany, At this time, Hoffman-LaRoche furnish it in tablet form in this country.

Present Epidemic of Amoebic Dysentery*

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(Continued from January 1st Issue.)

Symptomatology

These nine cases present a few clinical features which may deserve further comments.

1. It should be more generally appreciated that the majority of those who become freshly infested with Endameba histolytica, either show no clinical symptoms at all or manifest signs of only insignificant and commonplace intestinal disorder for which the physician usually is not consulted. It is this group of cases, many of whom receive no specific treatment, that is a greater menace to public health than the clinical cases. Systemic amœbiasis resulting in death may occur occasionally in this group.

2. The number of days between the probable day of onset and the day of diagnosis varied, in this series, from one day and two days to 125 days. The diagnosis was tentatively made by the physician, on his first call, in several of our later cases while in others, many days had elapsed before it was made, 60 days in one and 119 days in another, although they had definite abdominal symptoms, from the onset of the illness. In the earlier cases, the discovery of Endameba histolytica was unexpected by the attending clinician.

3. The presenting symptoms in acute amœbic dysentery may be so intense as to be easily confused with an acute surgical condition of the abdomen such as an intestinal obstruction, appendicitis, pancreatitis and the like. An operation has been reported performed with a disasterous outcome in a few instances.

4. A more chronic condition in the abdomen has also been suspected, such as a tumor or tuberculosis of the cecum or an infiltrating growth of the rectum.

5. In acute stage, the patient may become extremely toxic. He is deathly sick. The enlargement of the liver may be evident or a rapid pulse rate, before the institution of the emetine therapy, may be present indicating a toxic myocardium. In these cases, an elevation of temperature and a leukocytosis with a high percentage of young neutrophils are the rule.

6. A mistake, more commonly committed, is a diagnosis of this condition as a bacillary dysentery or an ulcerative colitis and the institution of a course of treatment which may tend to complicate the pathology of the disease and make a later diagnostic effort more difficult.

7. An equally dangerous mistake of making a positive diagnosis on an unreliable laboratory report or on a purely clinical ground, is bound to be committed, as a natural result of the wide publicity given to the present epidemic and of the admitted lack of facilities for laboratory diagnosis of this disease, at the present time.

Roentgen Diagnosis

The roentgen appearance of the colon in a well developed amœbic colitis is not sufficiently characteristic to be considered specific or diagnostic. The roentgenogram merely portrays the gross pathological processes in the colon, due to the invasion of Endameba histolytica. It would appear, however, that the changes, sufficiently extensive to cause a definite roentgen shadow develop earlier and disappear more rapidly under the specific therapy than in other types of colitis. This is probably accounted for by the fact that these changes represent an inflammatory edema and congestion and a secondary infection of the wall, all of which cause a more or less thickening of the involved areas and consequent spasm. The roentgenographic observation of the colon in amœbic dysentery is of aid probably in differential diagnosis and in ascertaining the progress of the disease under the specific therapy.

Laboratory Diagnosis

Five cardinal diagnostic criteria which should govern the identification of Endameba histolytica in fresh preparation are enumerated.

1. An active, progressive, often rapid, motility; 2. A hyaline, glassy, transparent pseudopodium, (ectoplasm), well differentiated from the endoplasm; 3. A ground glass, hemogeneous endoplasm containing, when fresh, no bacteria, foreign particles or vacuoles and showing no nuclear shadow; 4. Inclusion of fresh red blood cells within the amœba; 5. The cysts with four nuclei. The cysts are, as a rule, missing in the stools of acute cases; may appear in the stools of sub-

*Presented before the Minnesota Pathological Society, December 19, 1933.

acute or chronic cases; and are seldom seen during the course of treatment. On standing, the motile or vegetative form of Endameba histolytica may reveal a faint shadow of the nucleus, show vacuoles, bacteria and other inclusion bodies. The motility alone is not an important distinguishing feature of Endameba histolytica. In two or three instances, I observed a rapid, progressive and explosive motility in Endameba coli in freshly passed stools. I personally consider the demonstration of amœbas with ingested fresh red blood cells and the observation of a spacious, hyaline, glassy, transparent pseudopodium, well differentiated from the endoplasm in an amœba with a constant rapid, progressive motion, to be the two most important points in the microscopic identification of Endameba histolytica, in the absence of the typical cysts.

Grossly, mucus and fresh blood are the two characteristic features in the stools of amœbic dysentery. The mucus is glary, transparent and unmixed with pus or feces. Gross pus or the predominence of pus cells, microscopically, usually indicates either a mixed infection or a colitis other than amœbic as does the dull, heavy mucus, mixed with pus. Macrophages and phagocytes may appear in large numbers along with clumps of pus cells in bacillary dysentery but practically never in uncomplicated amœbic dysentery.

My own experience with the use of artificial culture media in the study of this organism is too limited to mention in this discussion. The Chicago investigators claim that they have been three times more successful in detecting Endameba histolytica in stools by the cultural method than by direct microscopic examination particularly in chronic cases and carriers. I have not resorted to the permanent stains for identification. Neither have I had any experience with the complement fixation test which may prove to be a useful method of diagnosis, at least in active cases of amœbic dysentery. With rare exception, however, a repeated examination of the stools in experienced hands may be sufficient to establish or rule out the diagnosis of amœbic dysentery, during the acute stage. The examination may be too time consuming to be practical for a busy laboratory man, especially in chronic and suspected cases. It should be emphasized that the laboratory diagnosis of Endameba histolytica should be made only by those who have had sufficient training and experience in medical protozoology. The average laboratory technician in this part of the country is not to be relied on in the diagnosis of this disease. On the other hand, it would be equally dangerous to make a positive diagnosis of amœbic dysentery on clinical observation alone without the laboratory evidence as was advocated by Lund and Ingham[5] in their recent article. The bacillary type of dysentery should certainly be ruled out before the institution of the emetine treatment. It should be remembered that unlike other obscure clinical cases, the diagnosis of amœbic dysentary may be established with comparative ease, in many instances, by a mere microscopic examination of the stool by a competent examiner. Therefore, an often expressed opinion that in a very high proportion of the cases of amœbic dysentery, Endameba histolytica cannot be demonstrated in the stools, must not be accepted, when dealing with acute cases such as we have had in the recent weeks. The thesis is, probably, applicable to the carriers, chronic or neglected cases but not to most of the active clinical cases. In the presence of repeated severe diarrhea, if a careful search for Endemeba histolytica in every stool passed proves negative, it would probably be justified to exclude an amœbic infection or, at least, to withhold a definite diagnosis, even in times of an epidemic, until other laboratory methods have been tried and proven otherwise.

Undiagnosed Dysentery

During the past two months, literally hundreds of stool specimens have been examined, many of them from healthy individuals, merely to rule out a possible amœbic infestation. Many others were from cases actually suffering from abdominal discomfort and diarrhea of from a few days to many months duration. The stools in such cases are usually either liquid, semi-liquid or mushy, often mixed thoroughly with mucus and showing gross pus with or without a small amount of fresh blood. Microscopically, they may show many pus cells and macrophages—the latter may be mistaken for still amœbas by the inexperienced. The agglutination test on the blood from these cases in which no Endameba histolytica was found on repeated examinations, was positive with B. dysenteriae of the Shiga type in the dilution of 1:800 in three instances, 1:400 and 1:100 in one instance each. This may possibly mean a fairly wide spread occurrence of acute and chronic bacillary dysentery among those suffering from abdominal cramps and diarrhea at this time although a possible co-existing amœbic infection can by no means entirely be ruled out. Furthermore, the cultural isolation of the offending organism is essential in the positive diagnosis of bacillary dysentery. In one of

these cases, many actively motile Endameba coli were also demonstrated. Two other cases showed an atypical agglutination with B. Typhosus.

Needless to state that there have been a number of cases in whom nonpathogenic amœbas and flagellates were demonstrated either in encysted form or in motile form. Endameba coli may show a most active, progressive motility, quite dramatic and impressive to the observer. In two instances, they were found in individuals who presented symptoms suggestive of amœbic dysentery. Two young women who are co-workers in a certain cafeteria revealed Endameba coli in their stools. Two members of the family whose husband was a victim of amœbic dysentery and the wife and mother of the husband and daughter, who were the victims of the disease showed Endameba coli in their stools. The evidence of transmission of Endameba coli from one member of the family to another or from one food handler to another may constitute an index of the prevailing hygienic practice among these people, much in the same sense as the presence of Bacillus coli in water is a bacteriological index of a drinking water.

These facts should doubly warn the physician of the importance and imperative necessity of differential diagnosis between these various types of dysentery.

Pathology

Unfortunately, except for the small piece biopsied from the rectum of Case 5, no material was available for pathologic study. A case of systemic amœbiasis[6] who was autopsied in May of this year disclosing multiple abscess of the brain as well as abscess of the liver and lung showed a minimum lesion in the colon represented by a single infected diverticulum in the sigmoid. The lesion obtained in the biopsied specimen from the rectum of Case 5 shows microscopically typical uncomplicated changes due to the invasion of Endameba histolytica and merits detailed discription. Microscopically, there is a slit or creta-like ulceration in the mucosa which communicates with a wide submucosal space filled with mucus exudate comperatively free of purulent inflammatory cells. The amœbas invade the mucosa and there multiply and cause non-suppurative necrosis of the submucosa through their cytolytic action. The submucosal lesion spreads laterally causing the over-hanging of the mucosa. With secondary infection, a purulent exudate pours into the field causing gangrene of the over-hanging edge of the mucosa and extension of the infection into the base of the ulcer. There are a multiple of such ulcers which form the basis of a characteristic amœbic lesion of the colon. It should be remembered that a gross appearance of the colon in amœbic colitis may so altered by a co-existing bacillary infection or a severe secondary or terminal infasion of micro-organisms as to render diagnosis practically impossible. Amœbic dysentery when discovered early and treated properly may probably seldom cause death. Death may follow a systemic dissemination in which the autopsy may reveal a typical amœbic lesion in the colon.

Summary and Conclusions

1. The recent epidemic of amœbic dysentery has afforded us a unique opportunity of studying the disease in its manifold manifestations. In our laboratory alone, ten proven cases and two suspects have been encountered in the past two months. The experience has not only been unusual and interesting but practical and instructive.

2. The number of cases of amœbic dysentery throughout the country as well as in Minnesota which are already known to have had the origin in Chicago is large enough to warrant our belief that amœbiasis may, in the future, become as common and universal a menace as any major disease which we know today in this part of the country.

3. The presenting symptoms of amœbic dysentery even in so small a series as ours, have been more atypical and baffling than our usual conception of this disease has led us to believe in the past.

4. The laboratory diagnosis of this disease may not be difficult in experienced hands. It should not be delegated to technicians with little or no experience. In the light of our present experience, clinical pathologists and responsible laboratory technicians are well to prepare themselves in practical medical protozoology to meet future contingencies.

5. Where possible, earnest attempt should be made to rule out all other forms of dysentery and ulcerative colitis and the like before a clinical diagnosis of amœbic dysentery is made and the specific therapy instituted. A danger of a wrong postive diagnosis should be avoided.

6. Many volumes and innumerable articles have been published on the subject of amœbiasis and amœbic dysentery since 1875 when Lösch observed an amœba in the stool of a patient suffering from dysentery. Because of the probability of wide dissemination of this disease throughout the Northwest as a result of a present epidemic,

amœbiasis should be more frequently considered in the differential diagnosis of obscure abdominal conditions, than it has been in the past.

Discussion—Amoebic Dysentery and Food-handlers

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One effect of the story of the extensive spread of amœbic dysentery from Chicago hotels and of the suggestion that the source of this epidemic may have been food handlers has been the development of insistent demands from certain quarters that Public Health authorities require and undertake the examination of all persons engaged in the preparation or serving of food to the public. Consideration of what this would accomplish and of what would be required to carry it out makes its impracticability clearly evident. The chief reasons that it would be impractical to attempt the examination of all food handlers are as follows:

1. As Dr. Magath has stated, six specimens of formed stools or three specimens of liquid stools need to be examined before one can be certain that no amœba or amœbic cysts are present in the intestinal tract. To carry out any such examination program would be an impossible task for practically every Health Department in America.

2. Even if an individual were found to be free of parasites at the time of employment, this would be no assurance that he or she might not become infected very soon after examination. For this reason a report of "no parasites" might give a false sense of security and make for laxity in the enforcement of measures of personal hygiene.

3. Only experienced parasitologists should perform such examinations if they are to be done, and there probably are not enough competent parasitologists available to conduct such routine examinations.

4. The administration of such a program so as to prevent the substitution of stool specimens from others by individuals who know themselves to be carriers would be extremely difficult.

How much simpler and more effective would be the adoption of a uniform and required procedure of personal hygiene for food-handlers. Clearly an individual cannot contaminate food if he has *thoroughly* washed his hands before handling the food. And whether or not cooks and waiters are carriers of disease, such thorough washing of the hands should be an inviolate rule before they touch either food or food receptacles.

The first requirement should be that in order to be licensed, hotels and restaurants install adequate toilet and lavatory facilities for their employees. Such facilities should include provisions for thorough washing of the hands in running hot water, with liquid soap and a hand-brush; and sanitary towels should be provided for the drying of the hands. Furthermore, the person applying for a license should agree to enforce the specific hygienic requirements adopted by the Board of Health. As illustrative of a routine which might be adopted is the following:

Procedures for All Food-handlers in the Service Enterprises of the University of Minnesota

1. Any person who is ill should not report to work, especially if such person is suffering from an intestinal disorder.
2. Any person who is absent from work because of illness must report to the Health Service for a permit to return to work.
3. On coming to work and after use of the toilet all persons who handle food must thoroughly scrub their hands in the following manner:
    1. If the clothes are changed, this should be done first.
    2. Remove all rings and bracelets and scrub each hand with the soap and brush provided for that purpose. Each finger should be scrubbed thoroughly, including the tips and under the nails. The scrubbing should extend to the elbows for cooks and others actually engaged in preparing food. Waiters need scrub only to the wrists. Two minutes of thorough scrubbing should be applied to each hand and arm. Rings are not to be worn while preparing food.

The responsibility for seeing that such provisions are carried out should rest with the person to whom the license is granted. Failure to comply rigidly with the requirements should be sufficient basis for cancellation of a license.

Of course, no regulation can be set up which every American citizen will observe; but most food-handlers try conscientiously to follow instructions and most managers try to

enforce them. And if Boards of Health were to make occasional inspections and hotel managers discharge a few unco-operative employees, the procedure would soon become an established and fixed routine; and the public not only would be protected against food infections from this source, but would have greater assurance of clean food than is possible under present conditions.

Abstract of Discussion

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Dr. Ikeda's interesting and valuable paper has presented a picture of amœbic incidence in the Twin Cities which is quite out of line with normal conditions. Ordinarily one or two clear-cut cases of acute amœbiasis during the year would come to the attention of those particularly interested in the topic. He discusses 10 cases reported in about a month's time from one hospital.

Whether all of these were actually acquired at Chicago is questionable. We have always had and long will have local cases and the variable period of incubation of the disease makes it impossible to charge all of these and similar cases definitely to the hospitality of the "Windy City."

The question of incidence of *Endamoeba histolytica* infection in this region is one which is often raised and one which becomes of vital importance under present conditions. In considering it, it is necessary to bear in mind certain very common sources of error.

In the first place, accurate knowledge of the role of amœbas in the causation of disease is of very recent origin. Although it is over a half century since Lösch clearly described a case and supported his conclusions by experimental evidence, the work of Walker and Sellard's in 1913, based on human experimentation really formed the basis for modern concepts of the problem. In spite of important scattered work by protozoologists, it was not until near the close of the war that any distinction of species of intestinal amœbas of man beyond *Endamoeba histolytica* and *Endamoeba coli* was recognized by medical men. At least five such species are commonly encountered in feces examinations of human patients in this region. Although there have been many conflicting opinions and an enormous amount of work on the problem, only one of these species, *E. histolytica* is known to be pathogenic. To the zoologist these various species are as distinctly marked as are the dog and the fox, or wolf, or a toad and a frog. The constantly recurring statistical studies which fail to take account of these differences bear their own condemnation.

Apart from the fact that these various species are commonly assigned to either *histolytica* or *coli,* an additional source of error is the ease with which macrophages, distorted epithelial cells, Blastocystis, various fungus spores and other foreign bodies may be mistaken for "non-motile" amœba, "precystic stages" or "cysts," and serve to swell the statistics. This danger is increased because of the current figures in the literature, which indicate an incidence in some cases as high as 50 per cent of the population! It must be recognized that even the relatively conservative figures of 10 per cent are derived largely from examination of military and institutional groups, and of residents of our southern states.

On the other hand, Andrews and Paulson, 1932, examined a series of 522 out-patients of a Baltimore hospital residing in their natural environment, and found but a single case of *E. histolytica.* The total incidence of protozoa was but 10.9 per cent. These investigators very justly consider that their group was more nearly representative of the total population resident in the temperate zone than the military and institutional classes or the rural groups which were being reported on in certain areas of the South.

Out of 500 ex-service men examined by me in 1928-29 there were 162 harboring protozoa and of this number 7, or 4.3 per cent, had *E. histolytica.* These were but 1.4 per cent of the total 500.

In the last month or so I have examined a group of 51 food handlers, working under congested conditions. On a single but very thorough examination, checked by stained slides, 31 per cent were found to have protozoal infections, a condition which indicated necessity for rigid sanitary regulations. Only one of the 51 exhibited *E. histolytica* though in view of the crowded conditions and the known irregularity in discharge of cysts, it is probably that other cases might have been revealed by a series of successive examinations.

On the whole, and considering many examinations of normal individuals, I question whether there is to exceed one per cent of our local population infected with *E. histolytica.* Repeated examinations of patients suffering

from intestinal troubles might reveal upwards of 5 per cent. As a matter of protection to himself and particularly to his contacts, a person who harbors cysts should be treated. However, it is well to recall that from what is known regarding such infections in persons who show no clinical symptoms, the finding of cysts in discharges of a patient must not of itself be assumed to be the explanation of the particular intestinal disorder of which he complains.

Discussion

Thomas B. Magath

That an epidemic of tropical dysentery took place in a city far north of the Equator and was spread to other parts of temperate North America is not surprising to a large group of men in The Mayo Clinic who have been studying amœbiasis in the temperate zone ever since the first paper on the subject was published from the institution by Sistrunk in 1911. Since then numerous contributions have been made on the subject from the clinic, and attention repeatedly has been called to the widespread presence of this disease in temperate zones. These observations have been confirmed by many workers all around the world and there can be no question but that the disease has existed for many years both north and south of tropical areas. It is not unlikely that the disease was spread by the lanes of commerce which developed from the southern climates into the north but at the present time evidence is conclusive that it is well entrenched the world over.

The method by which this particular epidemic was started is not clear in my mind, despite the reports from Chicago concerning its transmission by foodhandlers in some hotels and restaurants. The food-handlers could transmit the disease is readily understood, but the deadly accuracy with which this disease was transmitted is not consistant with experimental and clinical observations. The evidence suggests a much more direct mode of transmission than contamination of food by hands of careless employees. It suggests to my mind the possibility of a cross connection in some hotels between the sewage and the water systems. That such connections exist in some places is a matter of record. This was so definitely demonstrated in hospitals that regulations are in effect governing cross connections in the hospitals of the Chicago area and if there were cross connections in some of the hospitals similar conditions may exist in some of the hotels. Since the cysts of amœbas are not killed by the amount of chlorine put in the Chicago water system, it is possible that they have been transmitted by this method.

It is difficult to estimate the degree of infestation throughout temperate America. Some men, such as Colonel Craig, believe that the disease may be present in from five to ten per cent of the population and certainly in one per cent. The figures of Meleney, for certain isolated regions in Kentucky and Tennessee would indicate that the percentage is much greater, but our figures, which include a fairly representative cross section of the country, indicate that the infestation is not greater than two to three per cent. Whatever the figure is, it would indicate that a large number of people are suffering from, or harboring, this parasite in their intestinal tracts.

The method by which amœbas implant themselves in the intestine has been the subject of many investigations. Martin, in my laboratory, studied in detail the manner of attack in the kitten. He determined that the attack is entirely superficial and that the amœbas, probably excreting a lytic substance, are able to dissolve off the epithelial cells of intestinal mucosa as well as the interstitial tissue. This attack takes place in minute portions of the intestine where stasis has been caused by the natural folds and crypts of the intestinal mucosa. Once having denuded the surface, the amœbas are able to penetrate the deeper regions, invading the glandular crypts and eventually reaching the mucosal surface. Here the lytic process continues until a large undermining ulcer is formed. In early lesions this undermining is not seen, and no lesions ever were discovered beneath the surface of the mucosa in which the surface erosion was not present. Sometimes these lesions become confluent, and large areas of the intestine are injured, leaving the typical punched out, overhanging, edged ulcer.

Diagnosis of the disease rests primarily on laboratory observations and, from a scientific standpoint, no diagnosis of amœbiasis should be made unless the organism is found and clearly identified. The most common and practical method is examination of stools. If the patient is having active diarrhea, with blood and mucus, the organisms may be readily seen in their characteristic form. If the patient is not having diarrhea, two methods of approach are open. Examination of the formed stool will reveal the cysts, while examination of a liquid stool, following administration of epsom salts, will reveal the motile forms. One must use the method which is best adapted to the particular situation, and no one should consider himself competent to examine such material unless he is able to identify the

organism in both stages with a high degree of accuracy. Our observations lead us to believe that in order to diagnose approximately 100 per cent of infestation, one must examine at least six formed stools. The same effect will be obtained by examining three liquid stools. Another method consists in obtaining the material through the proctoscope. Since in only a third of the cases are there ulcers of the rectum and rectosigmoid, it becomes readily apparent that this method has very definite limitations. However, an excellent demonstration may be made by obtaining a smear from the base of an ulcer, through the proctoscope, for then one sees thousands of organisms in a small space. Still another method consists of culturing which, in our hands, has not proved as satisfactory as direct examination of stools. However, there are advocates of this method who claim better results. The last method consists of a complement-fixation test which has been devised by Colonel Craig and has been repeated by several competent observers. This is an intricate test and the antigen is extremely difficult to make.

Whether we will see satellite epidemics from this focus in Chicago remains to be seen, but it behooves every physician to be on the alert to detect these cases and to urge on his local sanitary board that it take means to prevent the spread of the disease in his own locality.

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The JOURNAL LANCET

Represents the Medical Profession of
MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA

The Official Journal of the

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South Dakota State Medical Association
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MINNEAPOLIS, MINN., JANUARY 15, 1934

THE FEDERAL EMERGENCY RELIEF LOAF

It is now exactly three months, since we referred editorially to remarks made by Federal Relief Administrator Hopkins on emergency medical relief. Slowly, for an "emergency," but with occasional spurts of speed, the machinery is being set up to provide medical care for the needy in their homes.

We have received some inquiries from our readers as to the present status of this matter and can only say that, delayed by many changing problems, it is gradually shaping itself into what we hope will be a satisfactory and workable proposition. The physicians in the various localities must evidence a willingness to accept the ordinary fair fees discounted 40 per cent by reason of the present emergency. Then the county relief agency must make a request of a grant from the state relief administration that in turn asks for its share from the federal fund that has been provided for such use.

The medical profession has suffered materially but not so ignominiously as some that might be mentioned. They are coming out of this depression unsullied by the stigma of avarice and insatiable greed that has cast its blight upon so many persons in responsible positions. One loaf is better than none, and really, this is not a case of accepting a 40 per cent discount; it's accepting 60 per cent or nothing.

A. E. H.

"WHAT SHALL WE EAT AND WHAT SHALL WE DRINK"

Historical commentators are wont to remind us that until comparatively modern times, the lot of the average man was chiefly a normalcy of semi-starvation with occasional periods of gluttony and surfeit. Brillat-Savarin* has been rediscovered. Metropolitan food emporia reflect his name; certain magazines of limited circulation feature the return of wine and give in some little detail the brands and sequences in terms of recipes and menu fabrication, allocating to each fish or fowl the proper vinous addition—indeed, a spirituous bouquet. They even go farther and indicate how to re-arrange the basement into a suitable wine stube; albeit no suggestions are given as to making over any of the Volstead-devised impedimenta that from now on should only clutter up the place and confound the furnace.

Little analysis is needed to show us that if there are any advantages of highly ordered society based upon widely practised trade and commodity interchange it is to provide said average man with more than mere sustenance; that a permanent job should make him a steady consumer and thus the munificence of the land and sea—above and below—should not just accumulate and clog the avenues of commerce.

Now enters the field (and the need of making this editorial suitable for a medical magazine)

the position of the doctors, and a professional trend that is often far from logical. Few people need ever be told that they should avoid meat or its equivalent. Even nephritic patients, except in the late stages of the chronic form, are not benefited by avoiding flesh foods. Contrariwise, low protein diets, chosen vicariously or recommended by physicians, lead easily to degrees of dietary deficiencies that may more than the bustle of our period induce the fatigue and restlessness behind many neuroses. Obesity (so abhorrent to insurance companies) is a visitation bestowed either by unhappy heredity or an excessive zeal at table plus a taste development inhibited at the infantile stage of glucose worship. Hence, let us have another Brillat-Savarin who will do for the masses in an age of plenty and poverty what that noted savant tried to do for the wealthy and elect, when a feeble Louis XVIII was attempting to reconstruct after Napoleon and the Commune.

This is a day of superb refrigeration and unsurpassed availability at modest prices of the very august fruits of the entire earth. If an occasional brakeman dies incidental to the hazards of his occupation it is no reason to abandon that great arm of transportation. If an occasional human "digs his grave with his teeth" it is no reason to preach universal asceticism and withhold a modicum of the prosperity which may follow the accepted fact that in a land of sport-page readers, "Eating is one of our best indoor sports."

We were advised to abstain and win the war; let us find the means to consume (advisedly) and establish a peace. Man is an animal undeniable, and the hungry of all species are quarrelsome.

E. L. T.

VENESECTION, PHYSIC AND DIET

Dr. Logan Clendening, a medical rationalist, included among other advice in one of his popular magazine articles, "Avoid cathartics as you would the appearance of evil."

Just as venesection was uppermost in the minds of those who practiced the healing art one hundred years ago, so purgation has held sway during the past fifty, and the science of medicine has become synonymous with physic today.

Of course, Dr. Clendening's admonition was not directed to the sick but to those who would maintain their good health, and yet we would go farther. We would like to ask the men of medicine if, in their opinion, the use of carthartics is not being overdone in the routine practice of medicine? We are certainly getting away from the invariable habit of such administration before abdominal operations and two or three days *post partum*.

Proper diet is now often substituted where physic formerly was employed—and that brings us to a delicate subject. It must be frankly admitted that hospital diets are the subjects of much ridicule and censure by many who have had to endure them; and the attending physician does not enjoy hearing such criticism. He takes it to heart as if it were a personal accusation. In a measure it is, and that's why he feels it so keenly.

The American Dietetic Association has been trying to solve this problem by inspection of hospitals to determine whether or not their established standards for courses for dietitian internes were satisfactory. In the official Journal of that association for September, 1933, appears a complete list of hospital courses so approved. Minnesota is the only state in the northwest having any hospitals on the list, and the Swedish in Minneapolis and St. Marys of Rochester, are the only private hospitals in the state that have received recognition. Others may be added later. We welcome this, because dietetic consideration in health as well as in disease, are taking on, ever increasing importance.

*Physiologie du Gout (Physiology of Taste).

A. E. H.

MEDICINE AS NEWS

Subjects of a medical nature are being discussed more frequently in the public press. Here are a few taken at random that have appeared of late. "Chicago Doctors Vote O. K. on Advertising," "Physicians to Advertise," "Doctors See the Light," "Physicians Urge Advertising to Inform Public," "Encouraging News About Cancer," "Claim County Doctor Should Bid for Work," "Advertising Health," "The Family Physician," "Doctors Urge Children be Protected from Diphtheria," "Scale for Nurses Takes Big Tumble," "Surgeons Observe 100 Years' Advance," "Family Doctor Abreast of Times, Meet Told," "Sorry Plight of Hospitals," "The Life Span," "Hospital Insurance Advised for Nation," "A New Case of Sleep Sickness in Minnesota," "We're Sill Lagging in Social Progress Says Doctor Crile," "Hospitals Are Vital Force in Recovery Program," "Diabetes and Cancer," "Dr. W. J. Mayo Hails Religion as Universal Comforter," "Hospital Care of Indigents Studied."

The report of sensational new cures and unripened speculative inferences have always crept into the daily news and still intermingle with

such items as have been here enumerated. These, for the most part, are of a higher order and serve to enlighten the public on problems that the physician has to meet. Now that they are often found in the daily paper, it behooves the man of medicine to scan the pages of the morning edition before he mingles with those who look to him for an interpretation of the medical news. Each must be a monitor for his clientele.

A. E. H.

Proceedings Minneapolis Clinical Club

Regular Meeting, November 9, 1933

President, Dr. H. Bright Dornblaser, in the chair.

SYMPOSIUM ON ANGINA PECTORIA

1. Pathology, Dr. J. S. McCartney.
2. Medical Aspect, Dr. Donald McCarthy.
3. Surgical Treatment, Dr. A. A. Zierold.

Dr. J. S. McCartney: As has been indicated, angina pectoris is a clinical term and not in any sense of the word a diagnosis which the pathologist can make at post-mortem. In order to make a diagnosis of angina pectoris he must have the clinical story. In cases of clinical angina pectoris there are two things which the pathologist finds; either a coronary sclerosis with or without thrombosis, or a syphilitic aortitis with narowing of the orifices of the coronaries.

We have no instance in the Department of Pathology where there was a clinical diagnosis of angina pectoris with a normal heart or aorta. In every instance there is some lesion, either of the aorta or of the coronaries, which raises the question whether any of these attacks of angina are due to spasm of the vessels. Certainly at the time when these people die there is definite organic disease and never a smooth, clean coronary or aorta—always a lesion.

The following slides illustrate some of the things we found from our post-mortem records:

Slide.

This gives you the percentages along this column, of the total group of all cases of cardiac diseases. Of course, you notice that we take up in this the various types except the congenital heart lesions. You will notice that as far as we are concerned tonight, there is just this one line, which has to do with the subject under discussion, syphilitic aortitis with narrowing of the coronaries which accounts for two per cent of the deaths.

The other chart takes up the other types of cardiac diseases. In the groups, the hypertensive with coronary disease and the individual who is apparently not a hypertensive and who had coronary sclerosis. If we remember the two per cent we have from the syphilitic aortitis we find that 22½ per cent of the deaths in this series of approximately 2,500 cardiac deaths are due to coronary disease, either in the coronary itself or in the root of the aorta from syphilis.

Slide.

To look at this chart you will think, offhand, that the individual without hypertension is perhaps more likely to have a coronary sclerosis than the individual who has a hypertension. This may be true because the line of differentiation in the two groups is on a basis of heart weights. In the case of a male, any heart weighing 500 grams or more without heart lesion was considered a hypertension heart. In a female, 450 was the upper limit of normal. It may be that many hearts of less than these weights were really hypertension but there is no record of blood pressure. If arteriolar sclerosis of the kidneys is taken as an adequate basis for assuming the individual had hypertension, then many of these cases will have to be changed from this group, so that of the coronary sclerosis 60 per cent will be up here in the hypertensive instead of only 40 per cent.

That makes it appear that the coronary disease is more likely to occur in an individual who has hypertension than a non-hypertensive individual.

Slide.

I should have said that in these charts these individuals who are labeled as coronary sclerosis deaths are not individuals in whom the pathologist found coronary sclerosis. The number would increase very tremendously if any lesions at all were counted in. Here only those cases which were definitely coronary deaths were considered.

We commonly find, at postmortem, coronary sclerosis of some degree and it does not necessarily mean that it was a serious condition because the amount of sclerosis present in the coronaries varies just as it does in other arteries of the body.

Slide.

In addition to finding coronary sclerosis or syphilitic aortitis there is one other thing that we find and that is, myocardial scars. The myocardial scar occurs in two different conditions and of two

types. One, the patchy fibrosis without any relation to the vessels but in the distribution of the vessels, and then those of inflammatory origin.

I thought it would be of interest to show something of the incidence of coronary sclerosis and of myocardial fibrosis in the individuals who are hypertensive and who die in one of the four ways —either from congestive failure, from coronary sclerosis, from cerebral hemorrhage, or from uremia.

Slide.

This is a series of cases where hypertensives die with myocardial failure. You will notice that we have here about 16 per cent of severe coronary sclerosis, but severe myocardial fibrosis only in 2½ per cent.

Slide.

These are deaths from cerebral hemorrhage. Here the percentage has jumped from 16 to 38 with severe coronary disease. Severe coronary fibrosis did not occur at all, a slight degree in something over one-third.

Slide.

This is from a case where the death was of the coronary type. We do not always know that the patient had the symptoms of angina pectoris but he died, apparently, a coronoary type of death.

Here we find there is a severe coronary sclerosis in 100 per cent of the cases, a slight fibrosis in 46 per cent, almost 95 per cent of the cases with severe coronary sclerosis have some degree of myocardial fibrosis.

The coronary sclerosis means the thickening, the narrowing of the lumen or the calcification and with or without occluding thrombosis.

Slide.

These died because the syphilitic aorta ruptured because there was a narrowing of the coronary orifices by the syphilis, but no severe degree of either sclerosis or myocardial fibrosis was found.

Slide.

This is the type of scar that you find in the myocardium due to occlusion of the vessels. This is apparently a replacement fibrosis due to obstruction in the lumen of the smaller coronary vessels with atrophy of the fibers and replacement of those fibers by scar tissue.

In some instances, particularly where we have had a larger vessel occluded and the patient survives for a time, we have an infarct. These scars do not stand in any definite relation to the arterial wall. They are irregular, scattered through the muscle in small area or large areas, depending on the size of the vessels that are obliterated.

Slide.

This type of lesion found in subacute bacterial endocarditis is an inflammatory process and is called periarterial fibrosis.

Slide.

In this you can see how common the periarterial fibrosis is in subacute bacterial endocarditis, but is not present in the rheumatic type of lesion nor in the recurrent type.

It appears that there is no case of angina pectoris without an anatomical basis either in the aorta or coronaries. Coronary sclerosis which includes the thrombosis is apparently more frequent in the hypertensive individual than in the nonhypertensive but that is not absolutely certain. In the case where death is due to coronary closure, there are commonly more or less extensive scars scattered through the myocardia.

Summary

Dr. Donald McCarthy: The treatment of the patient with angina must include much more than routine giving of nitrites, alcohol or morphine. It must start with a painstaking and accurate general examination as well as the examination of the cardiovascular apparatus. It must include the treatment of any other factors which may be depressing the individual's condition of health with due regard to care however in eradication of foci such as teeth, tonsils, infected sinuses, etc. It must include the estimation of the patient's reaction to various physical and nervous stimulus and the study of the patient as an individual with individual characteristics rather than a study merely as a cardiac case. Finally it must provide a careful, watchful observation of the patient with a rest, etc., the object being to have the patient derive the utmost in usefulness from his physical machine while at same time conserving his heart as may be needed in his particular case.

Summary

Dr. A. A. Zierold: The surgeon is concerned with the type of coronary disease characterized by narrowing of the lumen due to vaso spastic disease, with those cases not threatened by immediate disaster, with those cases where pain is the outstanding factor. Surgery is directed toward relief of pain only. Treatment is directed to mid and inferior cardiac nerves. Blocking of cervical and thoracic ganglia with alcohol is a successful method. Technic described.

Discussion

Dr. F. W. Wittich: I am very glad to hear these very interesting papers on the subject. I think it was about fifteen years ago that Dr. Staples gave a paper in his humorous vein before the Hennepin County Medical Society and emphasized the role of syphilis in angina pectoris. One

would get the impression that the occurrence of angina was rather high with syphilis but Dr. McCartney's statistics showing the low incidence of syphilis would disprove this.

Angina pectoris, I think, is rather a poor descriptive term. It is a symptom caused by at least five or six conditions. It is a term that is rather confusing and some day the cardiologist may find a new word for it. At least 90 per cent show coronary disease with myocardial changes, etc. I think from the clinical standpoint certain things should be emphasized in this discussion. That is, the symptoms leading up to angina should be thought of as possible coronary disease when an individual past forty or forty-five with a moderate hypertension with evidences of early arterial changes as revealed by the opthalmoscope, careful palpation and by X-rays of the extremities, etc., who complain of some breathlessness out of proportion to ordinary exertion with a feeling of tightness in the chest or as the patient will sometimes describe it as a "bloated feeling" and point to their epigastrium rather than their hearts, the electrocardiogram should be thought of. They are sometimes taken for gall bladder disease or some other form of indigestion. The electrocardiogram will show coronary changes in about 70 per cent of these cases and long before the clinical picture of true angina pectoris with its advanced symptoms presents itself.

I think it has been twenty-five years since we had the various theophyllin compounds in the treatment of cardiac conditions associated with pain. It has only been probably the last ten years that the clinician has recognized its usefulness and what a valuable drug we have in the treatment of these distressing symptoms and especially during an attack if any of the salts of this purine body such as aminophyllin or theocalcin, etc., are given intravenously. In very many of them it acts quite satisfactory and it is all that is necessary. I think there will be less surgery in these conditions if one appreciates the value of early recognition and treating the basic condition of arteriosclerosis. One seems to see fewer cases with real distressing angina probably because they are recognized earlier especially since the use of the electrocardiogram and I am hoping that Dr. Ulrich will stress the features that are easily recognized in the electrocardiogram that should be more universally known and not limited to the cardiologist so that treatment could be instituted earlier. The nitrites, in my hands, have been more disappointing usually producing headaches and nausea, frequently making the condition more distressing than the disease. The comparatively short action obtained with sodium nitrite and nitro-glycerine makes these drugs less useful and for continued use I feel that the various theophyllin salts are far superior in relieving the symptoms and restoring the patient to a working capacity.

Was it an authority from Philadelphia who suggested continued use of bismuth subnitrate by mouth a few years ago? He recommended about ten grains of bismuth subnitrates three times a day claiming that nitrites were liberated in the intestinal tract and absorbed as such with a slow continued vasodilating effect. The drug has a constipating effect unless combined with magnesia.

I have had an elderly man on bismuth subnitrate for several years with moderate hypertension, arteriosclerosis and coronary disease. He seems better and his blood pressure is at a lower level but I could not say whether it was due to the bismuth. We know that many of these people suffer from angina pectoris are heavy eaters, live strenuously and "hit the ball" pretty hard. We should get them to control every phase of their activities. This requires individualization on the part of the physician and time should be taken to re-educate them how to live and eat. A proper mode of living, a rational drug therapy combined if necessary with surgical treatment should make these distressing cases much more comfortable.

Dr. Henry L. Ulrich: In regard to the attitude of the pathologist in discussing the syndrome of angina pectoris, he claims it is always on an organic basis. I think that opinion is more prevalent and becoming more fixed. I cannot help it nor can I get away from the fact that there are functional conditions which produce angina without any anatomical basis that is in the coronaries. If we admit there is a vaso-motor supply to the heart and we must admit this if they dilate, they must be able to contract, so that the old theory of coronary spasm causing angina is still on a legitimate basis. Again in other conditions outside of the heart, such as pernicious anemia and in hyperthyroidism where the heart cannot come up to the requirement you can get angina symptoms.

Again clinicians see patients with angina who, when they decompensate or go into fibrillation, have no more attacks of angina. Anatomically the condition is still there. The explanation, I think, is that under decompensation or fibrillation the coronaries may be dilated by the increase CO_2 in the blood. From a neurological standpoint, different people react differently to pain. The prize-fighter is quite insensitive to pain. The highly neurotic reacts severely to slight pains. Then our tissues get habits—the neural arc may get the

habit which is precipitated by all sorts of emotions, excitements, etc. The correlations of these differences lies in the types we are dealing with.

In regard to treatment, I would like to see instituted somewhere by someone who has the time and money, the idea of giving these people daily hyperventilation, first suggested by Dr. Henderson. Five to ten per cent CO_2 inhaled for five minutes dilates the vessels and you practically indulge in a three-mile walk without moving—or about the same physiological effect. This is not for the attack but for prophylaxis and readjustment of circulation.

We also have a method suggested by Dr. Rizer in the use of oxygen for the relief of pain in angina pectoris. This is quite successful, according to his statistics. I have not had enough experience with this method to give an opinion. The theory is that you are giving more oxygen to the tissues, thereby improving the metabolism. I think it is not the increase of oxygen—the increased supply of oxygen increases the liberation of CO_2. It is the CO_2 which dilates the vessels and increased muscular contraction as well as relaxation. In tissue metabolism oxygen only works under the stimulation of CO_2. It sounds like a paradox but it is true.

The symptoms of bloating, indigestive attacks are really reflexes from the heart through the vagus. You find these people saying: "As soon as I can belch gas I feel relieved." The gas retention may be due to pyloric spasm.

I have an old chap who likes to hunt. He says that if he eats his breakfast before he goes to the pass he has an attack of angina, but if he carries his breakfast to the pass and eats it then he does not get an attack. Little stunts like that the veterans of angina work out for themselves.

Like asthma, angina pectoris can become a habit. I have known of asthmatics who, to avoid doing something they did not wish to do, would throw a fit of asthma. Our tissues do have habits and the heart is not exempt particularly in its neurological equipment. We must treat the individual in angina very much as we do in other diseases and let the syndrome, so to speak, take care of itself.

The older clinicians used to think that angina is due to pressure on the aortic wall. There are many pacchionian bodies in the adventitia of the aorta and for this reason they considered it a source of pain. Probably these bodies may have to do with the vasomotor nerve of the heart although in pure aortitis without the involvement of the coronary orifices—anginal pains are complained of. And in acute rheumatic fever an aortitis is described with a great deal of substernal pain.

Dr. Jay C. Davis (by invitation): When a patient has an attack of angina pectoris it is a warning sign to stop all exertion until the attack subsides. It also acts as a mechanism to prevent one from over-exertion. If a surgical blocking is done to relieve one from angina, then the warning signal is lost and a patient is apt to overexercise himself with fatal consequences supervening sooner than he would have if he had or not had a block done.

In regard to Dr. Ulrich's remarks as to CO_2 dilating coronary arteries, experimentally on dogs it can be shown that CO_2 increases the coronary flow in two ways. First, it dilates the coronary arteries, and second, it weakens the contraction of the heart, thereby resulting in an increased flow of blood through the coronary arteries independent of dilation. This last mentioned increased coronary flow is due to the fact that the weakened contraction of the heart results in less compression of the coronary vessels by the heart muscle.

I believe the total thyroidectomies now being done in Boston for angina pectoris in people with normal thyroids is physiologically sound inasmuch as it would tend to decrease the patient's amount of exertion, but that in cases where the angina was due to a sclerosis of the coronary vessels there might come a time later when the lumen of the vessel is so small due to the progressive sclerosis that the angina attacks would return even though the patient had a much lower metabolic rate than normal and a slowing up of physical and mental activity.

The closure of small coronary vessels could be very easily overlooked by the present method of doing post-mortems, and experimentally it has been shown by Dr. Fred Smith, of Iowa, that where a small coronary vessel in a dog was tied off, when the dog was autopsied later after an interval of several months, if it were not for the landmark of the ligature a very careful examination would have missed the small fibrosed area.

Dr. Leo Murphy: With reference to Dr. Davis' remarks regarding the effects of total thyroidectomy in cases of associated hyperthyroidism and coronary disease, my experience has been that in many instances the coronary symptoms were completely relieved for varying lengths of time only to reappear later. Certainly this type of surgical approach in the alleviation of angina pectoris and of cardiac decompensation not associated with hyperthyroidism opens an extremely interesting field. I thoroughly enjoyed Dr. Zierold's excellent presentation.

Dr. J. M. Lajoie: It just occurred to me that in 1904 I saw a patient who had definite angina pectoris. His symptoms were as follows: He would walk along and suddenly would have a severe vise-like pain in his chest. He might sit down and wait three or four minutes and then slowly get to where he could rest. Dr. White saw him three or four times, confirming the diagnosis. Two years ago he applied for life insurance, gave his history and the company requested a cardiogram. It was negative and he was given a good sized policy. He is very well now.

Dr. E. T. Evans: I would like to add a death from coronary disease due to thrombo-angitis obliterans, at this time, to two previously reported cases. One of the previously reported cases happened to be on my service at the United States Veterans Bureau Hospital and was reported from another clinic. The case which I should like to report had obtained service connection the night before he died. He was given a large check for past compensation and, of course, when he was found dead, foul play was suspected and an autopsy done. This disclosed death from coronary disease.

With reference to Dr. Zierold's remarks, I think if anyone has watched or assisted at this type of operation, one realizes the difficulty of finding the ganglia. However, it lies very close against the body of the vertebrae deep to the transverse process and one cannot help but be impressed with the fact that if this also is reached with a needle it could be injected with alcohol with relatively little danger. We have injected quite a number at the United States Veterans Bureau Hospital and have always been able to obtain results which have, over the short period of observation, been satisfactory. It is a relatively simple procedure in that type of case where one can definitely determine by subjective or objective signs whether or not one has reached the site of ganglia. In a pure cardiac case it is pretty difficult to know, during the procedure, whether or not you have accomplished the immediate result you are striving for.

Dr. Leo Murphy: May I ask whether or not there is agreement among internists relative to allowing a patient to continue in or to return to executive type of work after it has been definitely established that he has myocardial damage secondary to coronary disease?

Dr. Donald McCarthy: With reference to Dr. McCartney's discussion and to the question of the presence of organic pathology in all of the cases he has seen, I feel that we must remember that his observations are based on autopsy findings and that the cases which have a functional origin of pain do not appear at all in such series. Personally, I agree with Dr. Ulrich's statement that the pain may be, in many individuals, of functional origin. Certainly we know that tobacco in some people will apparently precipitate an attack of anginal pain which will disappear if the tobacco is discontinued.

In regard to the use of carbon dioxide and the work reported by Henderson, it would seem that this would be worth trying. Oxygen is especially useful in the patient with coronary thrombosis or marked failure in the coronary flow. In my own experience the acute attack usually has to be treated either with morphine, the nitrates or alcohol. I usually give nitroglycerin by mouth and follow this with morphine hypodermically if necessary.

In answer to the questions regarding the ability of the patient with anginal attacks to continue his work, I think that depends entirely upon the evaluation of the cardiac pathology present. In addition to this the reaction of the patient must be considered. We have all types of individuals. There are those who would rather be at work and who will be happier continuing to work even though they may shorten their expectancy by so doing, while others prefer to quit.

Dr. J. M. Lajoie: May I ask a question? It has been mentioned that practically all cases of angina pectoris which have died in an attack have a history of pathological findings in the heart. Is the opposite true? Is there a list of cases where they are pathological changes in the heart where there has been no history of angina or anything suggesting angina?

Dr. J. S. McCartney: Apparently I did not make myself clear on this question of angina. I think I said that by the time these patients got to us they all had a lesion. I do not know what they may have had five or ten years before that but at least, when we got them they all had some anatomical basis.

Dr. E. S. Platou: Is it not possible, by careful periodic health examination, to suspect the presence of this disease in an individual according to type? It seems to me that much has been said and much study devoted to the pathology and to the clinical aspects of the disease and perhaps too little to its prophylaxis. Is the periodic health examination adequate to discover early hints of a disease which seems to be occurring more and more at an early period in life? If not, what adjuncts are reliable?

Dr. Donald McCarthy (answering Dr. Platou): This could be answered yes or no. Cer-

tainly the diagnosis of coronary disease may frequently be made on the basis of history and physical examination and even when these are negative, electrocardiographic tracings frequently put us on the lookout for trouble. On the other hand, we all know that serious disease can exist which does not become apparent either on physical examination or electrocardiographic tracings. The fact that evidence of existing disease is not found in all cases should not lead us to depreciate the fact that in many cases evidence of diseases are found and the patient's expectancy definitely increased by careful advice.

DR. JAS. K. ANDERSON,
Secretary.

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Thirty-ninth Annual Session

SIOUX VALLEY MEDICAL ASSOCIATION

Sioux City, Iowa

Tuesday and Wednesday

JANUARY 23 AND 24, 1934

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PROGRAM

TUESDAY, JAN. 23

8:30 A. M.—Sound Motion Pictures
Courtesy of Mead Johnson and Company.

10:00 A. M.—Urological Clinic
Dr. C. M. McKenna, Professor of Genito-Urinary Surgery, University of Illinois
Clinic arranged by Dr. Lawrence Pierson

11:00 A. M.—"Diagnosis and Treatment of Spinal Cord Tumors"
Dr. A. W. Adson, Chief of Neuro-Surgery, Mayo Clinic

11:30 A. M.—Obstetric Clinic
Dr. F. H. Falls, Professor of Obstetrics and Gynecology, University of Illinois
Clinic arranged by Dr. R. E. Crowder

2:00 P. M.—"The Myxedema Problem"
Dr. A. C. Davis, Associate in Internal Medicine, Mayo Clinic

2:30 P. M.—Neurosurgical Clinic
Dr. A. W. Adson
Clinic arranged by Dr. E. R. Gelvin

3:30 P. M.—"The Significance of Blood and Pus in the Urine"
Dr. C. M. McKenna

4:00 P. M.—"Premature Detachment of the Placenta"
Dr. F. H. Falls

4:30 P. M.—Medical Clinic
Dr. A. C. Davis
Clinic arranged by Dr. Walter Harriman

6:30 P. M.—Banquet
Toastmaster, Dr. S. A. Slater
Speaker, Dr. Gilbert Cottam—"Then and Now"

WEDNESDAY, JAN. 24

8:30 A. M.—Sound Motion Pictures
Courtesy Mead Johnson and Company

10:00 A. M.—Surgical Clinic
Dr. O. H. Wangensteen, Professor of Surgery, University of Minnesota
Clinic arranged by Dr. Robert Knott

11:00 A. M.—"Certain Aspects of the Feeding Problem"
Dr. P. C. Jeans, Professor of Pediatrics, University of Iowa

11:30 A. M.—Medical Clinic
Dr. S. Marx White, Minneapolis, Past President of the American College of Physicians
Clinic arranged by Dr. Mark Wheelock

2:00 P. M.—"Acute Bowel Obstruction"
Dr. O. H. Wangensteen

2:30 P. M.—"Fractures of the Tibia and Fibula"
Dr. Robert Schrock, Professor of Orthopedic Surgery, University of Nebraska

3:00 P. M.—Pediatric Clinic
Dr. P. C. Jeans
Clinic arranged by Dr. Robert McBride

4:00 P. M.—"Non-Painful Features of Coronary Occlusion"
Dr. Marx White

4:30 P. M.—Orthopedic Clinic
Dr. Robert Schrock
Clinic arranged by Dr. J. W. Graham

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NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. P. R. Scallin, Clark, S. D., was recently married to Miss Louise R. Wiggins of Flint, Michigan.

A new hospital has been opened this month at Pine River, Minn., with Dr. and Mrs. A. J. Button in charge.

Dr. S. C. Newell, one of Helena, Mont., prominent physicians passed away early this month after a long illness at the age of 78 years.

Forty acres of land near Walker, Minn., has been deeded to the federal government, who will immediately construct a $250,000 sanitarium for tuberculosis patients.

Dr. A. J. Gilkinson, pioneer physician and for many years a leader in the state's Democratic party, died at his home in Osakis, Minn., after an illness of several weeks.

Dr. G. J. Gislason, for nearly 30 years one of the prominent physicians and surgeons of Grand Forks, died in his sleep from a heart attack at the family home, on January 4th. He was 58 years old.

Dr. F. W. Minty, Rapid City, S. D., is the defendant of a suit brought by one of his patients who desires to secure $20,000 from the doctor, claiming he had not received good service nearly a year ago.

Dr. Osmond N. Hoyt, retired physician who practiced in Pierre, S. D., 35 years and for five years was president of the state medical board of that state, recently died being 90 years of age. He had lived in Long Beach, Calf., 14 years.

A hygienic museum, the first of its kind in the United States, and modeled somewhat after the world-famous hygienic institute in Dresden, has been started by the Mayo clinic, Rochester, and will be opened to the public in a few months.

Dr. Otto F. Johnson, who has been in active practice in St. Paul during the past 15 years, died this month after an extended illness. Dr. Johnson was 59 years of age and a graduate of Hamline University Medical College in 1901.

Blue Earth County Medical Society's new officers were named at the annual meeting held at Mankato, Minn. Dr. H. L. Huffington, Mankato, president; Dr. H. O. Williams, Crystal Lake, vice-president, and Dr. Chas. Koenigsberger, Mankato, secretary.

Dr. Alvin T. Mathers, dean of the faculty of medicine at the University of Manitoba and a neuro-psychiatrist of Winnipeg, was the guest speaker at the meeting of the Hennepin County Medical Society this month. Dr. Mather's subject was "Medical Legal Problems."

Traveling by special train and in charge of 17 attendants, 70 patients from Hiawatha hospital, Canton, S. D., federal asylum for insane Indians, have been sent to Washington, S. D., where they will be placed in St. Elizabeth's Hospital.

Dr. A. A. Wipf, Freeman, S. D., died last month, after a short illness at his home in that city. Dr. Wipf was a graduate of Ruch Medical College, Chicago, and had been an active member of the South Dakota Medical Association for over 30 years.

The Northwest District Medical Society held their annual meeting at Minot, and elected officers for the year 1934 as follows: Dr. A. L. Cameron, Minot, president; Dr. W. E. Blatherwick, Van Hook, vice-president; Dr. J. R. Pence, Minot, secretary, and Dr. R. W. Pence, Minot, censor.

The annual meeting of the Red River Valley Medical Society was largely attended, with two papers being presented by Drs. F. F. Stocking, Hallock, and C. L. Oppegaard, Crookston. New officers are Dr. H. M. Blegan, Warren, president; Dr. Eskil Erickson, Halstad, vice-president, and Dr. C. L. Oppegaard, secretary.

The Rice County Medical Society held their annual meeting at Faribault, Minn., and elected officers, for the year 1934. A large list of members were present, with Dr. N. O. Pearce, Minneapolis, retiring president of the State Medical Association as guest speaker, and Dr. C. J. Plonske, Fairbault, presented a splendid paper on "Psychology of Fear."

The first meeting of the Olmsted-Fillmore-Dodge County Medical Society brought out a large attendance of members at Rochester, on the evening of January 3. After being served with a fine dinner, the following officers were elected: Dr. A. N. Sanford, Rochester, president; Dr. C. W. Woodruff, Chatfield, vice-president, and Dr. M. C. Piper, Rochester, secretary.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minne-

apolis and St. Paul (810 kilocyles or 370.3 meters). The program for the month of January will be as follows: January 17, "First Aid in Poisoning"; January 24, "Mental Health in Childhood"; January 31, "Jaw Tumors."

The Minnesota Pathological Society of the University of Minnesota Medical School Institute of Anatomy presented the following interesting program at their recent meeting: "The Recent Epidemic of Amœbic Dysentery," by Dr. Kano Ikeda, with a discussion by Dr. W. A. Riley, and "Further Experiences with the M. A. 100 Proteins," by Dr. E. S. Mariette.

Minneota's well known family of Sanderson's, descendants of the pioneer physcian, the late Dr. S. E. Sanderson, Minneota, Minn., have shown a strong penchant for medicine—three of the sons becoming doctors and the daughter a nurse. Now these same three sons have shown a common bent in another direction—civic activity in the towns in which they live. Each one of them is now mayor of his home town.

The Black Hills Medical Society held their annual meeting at Deadwood, S. D., and elected the following officers for the present year: Dr. Frieda J. Radusch, Rapid City, president; Dr. Francis Hummer, Lead, vice-president, and Dr. J. L. Stewart, Nemo, secretary. Dr. Radusch is the only women physician in this society, as well as the only woman in South Dakota, that has been honored by being elected the president of a society.

Lottie Grace Bigler, M.D., of Yankton, has received the appointment as Directer of Child Hygiene of the South Dakota State Board of Health. Dr. Bigler received her Degrees in Medicine and Surgery from the Woman's Medical College of Pennsylvania, at Philadelphia, Pa., class of 1912. Licensed by South Dakota in 1915. Dr. Bigler has continued the general practice of Medicine and Surgery, specializing in Obstetrics and Gynecology.

A special program of lectures and demonstrations in medicine will be held under the direction of the Mayo Foundation from March 5 to 9, inclusive. Mornings will be devoted to surgery, demonstrations of oxygen therapy and of intravenous therapy, and consideration of post-operative complications. In the afternoons medical subjects, including gastro-enterology, dermatology and syphilis, will be discussed, and a symposium on dyspnea will be held. In the evenings clinco-pathologic conferences will be conducted. While this program is arranged primarily for the Fellows of the Foundation, visiting physicians are invited to attend.

J. Theodore Weber, about 26 years of age, who lives at Wahpeton, N. D., has been warned by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners to refrain from practicing in the state of Minnesota without a license. For some time Weber, who claims to be a magnetic healer, has been coming to Fergus Falls, Pelican Rapids and Rothsay, remaining about a week on each trip. When interviewed at Wahpeton, Weber admitted that he had no license, that he was a former student at the Palmer School of Chiropractic at Davenport, Iowa, and was seeking to practice in order that he could get enough money to complete his so-called education. Weber was told that if he returned to the state of Minnesota a warrant would be issued for his arrest. Weber stated to Mr. Brist that he would not return to the state. If this man attempts to practice healing in any form in the state of Minnesota in the future, the Minnesota State Board of Medical Examiners asks that it be immediately notified at 524 Lowry Medical Arts Bldg., St. Paul, Minn.

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The JOURNAL LANCET

Minneapolis, Minnesota
February 1, 1934

New Series
Vol. LIV, No. 3

Orthopedic Clinic*

Melvin S. Henderson, M.D.
Rochester, Minn.

CASE I: Tuberculosis of the Hip. (Dr. C. J. Meredith.)

J. M., aged 9. His trouble began at the age of two years with pain in the left leg and limping. The diagnosis of Perthes' disease was made and the leg was placed in a cast which remained on for two years. He then had spasms of pain, night cries and fever and roentgenologic examination showed destruction of bone. A Mantoux test 1:1000 was positive. At this time a diagnosis of tuberculosis of the hip was made. There was also mild pulmonary tuberculosis. Traction was applied for a time and he was then placed in a cast. In July, 1930, he first came under my care, with pulmonary tuberculosis as well as tuberculosis of the hip. The temperature ranged from 99° to 100° F.

From this time until May, 1932, the leg was kept in a plaster cast, and the patient was given light therapy and rest in bed, etc. Extensive destruction of the head of the femur and of the acetabulum occurred. The process finally became arrested and moderately firm ankylosis was obtained.

On May 24, 1932, the cast was removed. Two months later he was fitted with a walking caliper and was allowed up. Since then he has been quite active, and attends school. He does not have any pain in the hip and has no fever.

Dr. Henderson: This undoubtedly is a case of tuberculosis of the hip.

The classical, clinical signs of tuberculosis of the hip are familiar; namely, limp, pain, and deformity. The pain may be extreme, and may cause the typical night cries of children. On the other hand, the symptoms may be mild and the only complaint may be that of limp. The chief characteristic of tuberculosis of the joints is that it is chronic and that it begins insidiously. However, occasionally it may begin acutely. When the acetabulum only is involved, the symptoms may be very mild, but if the head of the femur becomes eroded, and raw bone comes in contact with raw bone when the muscles relax, as happens when the patient drops off to sleep, acute pain results and children awake with a scream, confused, and bewildered.

The condition with which tuberculosis of the hip is most often confused is Legg's disease, Perthes' disease, or flat head. It really should be called Legg's disease, because Arthur Legg of Boston was the first to describe it as a clinical entity. However, Americans apparently prefer to tack some foreigner's name onto a disease, and to give the credit to a foreigner rather than to one of their own countrymen.

In Legg's disease, painless limp is the first

*Informal clinic at the Forty-sixth Annual Meeting of the North Dakota State Medical Association, Valley City, N. D., June 1, 1933.

sign. As this persists, roentgenograms disclose that the head of the femur is gradually becoming flattened. This somewhat extensive destructive process involves only the epiphysis and causes very little pain or discomfort. As the flattening of the head increases, absorption occurs, and this may go on to almost complete disappearance of the epiphysis. Finally, however, the stage of absorption is completed and reconstruction begins; shadows cast by little eyelets of bone reappear in the roentgenogram, and finally the epiphysis is seen to be rebuilt into practically normal shape, provided weight-bearing is prohibited. Some authorities insist that recovery occurs even if weight-bearing is permitted, arguing that treatment is not necessary. It is much safer to treat these cases of Perthes' disease by rest and restriction of motion, providing crutches and a high-soled shoe for the opposite foot, and applying a plaster of paris spica cast to the affected side. During the course of the absorptive stage in Legg's disease, there may occur some disturbance in the contour of the acetabulum, but this is comparatively slight and not so common as in tuberculosis.

This child has tuberculosis of the hip, has been well treated, and now the question of concern to the physician and to the parents is when will it be safe to leave off the splint? I believe that time has about arrived. The haziness and indistinctiveness in the roentgenogram has disappeared and the bony detail is good. There is no complaint of pain. If ankylosis develops it will be a fortunate occurrence, but if it does not, and although there is still a little painless motion present, this child should be permitted gradually to resume weight-bearing. It may be that he will have no further trouble and will obtain and keep what motion he has.

I believe that the treatment of tuberculous joints of children should be, in the main, conservative. Some years ago Russell Hibbs of New York, tracing the patients who had been seen in the New York Orthopedic Hospital, found such a high percentage of poor results following conservative treatment that he about-faced, and advocated fusion by operation in practically all cases, even if the patients were children. Although I cannot agree with this extreme stand there is, nevertheless, enough sound argument in its favor to warrant fusion operations on a certain percentage of tuberculous joints of children.

Case II: Anterior Poliomyelitis. (Dr. C. J. Meredith.)

R. C., aged 9, in October 1930, had an attack of fever, with nausea, pain in the right leg, and inability to walk.

The physical examination was negative except for the right leg. There were no meningeal symptoms. The reflexes in the right leg were absent and there was 90 per cent loss of motor power in practically all muscles of the thigh and leg. The temperature was 102° F., pulse 110.

The patient was examined on November 24, 1930, when the residual paralysis seemed to be confined to the right leg. The reflexes were absent and there was complete loss of power.

Complete rest and light massage were employed, and on December 15 a splint and crutches were ordered. On January 7, 1931, the splint was applied. The leg muscles were markedly atrophied. Massage and exercises were continued.

June 9, 1931, the patient was walking well with the splint and had slight power in the quadriceps and in external rotators of the thigh; there was very slight flexion of the toes but all other muscles were inactive. The splint was lengthened.

November 23, 1931, the leg muscles were about the same but the tendo-Achilles had tightened up somewhat. More exercises were advised.

Dr. Henderson: Infantile paralysis is a dreadful disease and, in spite of the best efforts of our bacteriologists and internists, up to the present time no vaccine has been worked out to prevent the disease, nor has any serum been made which seems definitely to prevent the paralysis once the infection has occurred. Epidemics occur, but the disease is always endemic and develops commonly in the warm season, when there are flies. Once the disease has developed in a given case, and paralysis follows, the paralyzed limbs must be kept at physiologic rest; that is, the foot must be prevented from dropping downward. the knee must be prevented from flexing, and so forth.

This patient can straighten his knee, showing that the quadriceps extensor is active. The adductors are better than the abductors of the hip. The hamstring muscles are a little weak. but his tendo-Achillis is fair and the foot has been maintained in a good position. He has had good care, and deformities have not been allowed to develop. As this child is asked to

stand on the affected side, you will notice that his pelvis droops, showing that the gluteal muscles are practically entirely out of commission. This means that no matter what is done for the knee or the ankle or the foot in the way of surgery, the greater part of the limp will persist, because of the weak gluteal muscles. Unfortunately, surgical measures to replace paralyzed gluteal muscles have not been successful. If, in the future, this boy's foot should have a tendency to turn into varus or valgus, fusion of the small bones of the foot, called triple arthrodesis, would help; the talus is fused to the calcaneus, the talus, to the navicular, and the calcaneus to the cuboid. I would like again to emphasize that the prognosis in this case as to recovery from the limp is poor, because of the paralysis of the gluteal muscles.

Case III: Poliomyelitis. (Dr. C. J. Meredith.)

M. A., aged 6, in June, 1932, was afflicted with a moderately severe case of anterior poliomyelitis. The case was a typical in that on two consecutive days, early in the paralytic stage, spinal fluid examinations showed no variation from the normal. She was not given convalescent serum.

She had a mild paresis of the right arm, and of the right leg. A splint was applied to the right leg to prevent deformity and rest and massage were carried out. She was allowed to walk in April, 1933, which she was able to do without support to the leg. There is still marked weakness of the muscles, particularly the extensors and flexors of the leg.

Dr. Henderson: In this case it is not a year since the paralysis occurred. Following an attack of infantile paralysis the circulation should be improved by massage but massage should not be undertaken as long as there is tenderness. The duration of tenderness varies; sometimes it is gone in a week, and sometimes it lasts for six weeks or more. Tests should be made of the muscles in the lower extremity, the gluteal muscles, the abductors and adductors of the hip, the flexors of the hip, the hamstrings, the extensors of the knee, and, in the foot, the tibialis anterior, the tendo Achillis and the peroneals. As power gradually returns to the muscles, their strength must be increased by massage and exercises, but the exercises should be carried only to the point of slight fatigue. Fatigue and over-stretching of paralyzed muscles delays recovery.

As the patient is stood erect it is seen that the gluteals are good, so that fortunately she will not have the gluteal limp of the boy previously shown. The muscles of the foot are weak, but persistent massage and exercises will help and improvement will extend over years. The prognosis in this case is particularly good, and the child probably will not need operation, but if the foot should prove to be unstable, the arthrodesis mentioned in discussing the previous case could be employed.

The question of the benefit of swimming exercises is often brought up. The only advantage of swimming is that the force of gravity is overcome. It is not well to over-emphasize this method of treatment because it is not possible for everyone to have access to a swimming tank, and the parents and the patient may feel that they are being denied valuable aid in treatment. As a matter of fact, swimming in itself is of minor importance, and is but an aid in carrying out exercises.

Case IV: Fracture of Femur. (Dr. M. D. Westley.)

F. Z., a boy, aged 12, when coming down a hill on skiis January 22, 1933, got his legs crossed and fell, breaking the femur in two places. Traction was made while the roentgenographic examination was carried out and these films show the findings. (Presented films.)

The patient preferred to remain at home, so a splint was applied with the knee flexed, with traction. A folded sheet was passed between the legs and tied to the head of the bed to keep the patient's body from sliding down. The pain was relieved and he lost very little sleep. One month later roentgenographic examination showed that we had good union and no shortening.

Dr. Henderson: This boy is very fortunate, for, although he had a bad fracture, he has a good result. Extension is the all-important factor in the treatment of fractures of the femur, and has been used down through the ages, still standing as the most valuable single adjunct in the treatment of fractures. Every once in a while something new turns up in the way of applying traction, and it is often extolled as a wonderful method. The Steinman pin and the Kirschner wire came into favor, and, more recently, the teachings of Boehler have come into prominence. But back of them all is the principle of extension.

In this case the shortening is negligible. It is perfectly correct for any surgeon, who is in good surroundings and has the necessary skill,

to open down to these fractures and plate them or use Parham bands or bone screws, but when a fracture can be treated conservatively without the use of "hardware," and so forth, it is certainly the method of choice.

Case V: Fracture Right Tibia and Fibula. (Dr. William Campbell.)

R. E., aged 21, on July 9, 1930, was crushed by the wheel of a farm tractor and sustained a fracture of the mid and upper third of the right tibia; about one-third of the fibula was broken into small fragments. He entered the hospital on the day of injury and examination showed the soft tissues badly macerated and a fragment of the tibia projecting through the skin.

Dr. Henderson: This young man is to be congratulated on an excellent result. He had a bad compound fracture. With the coming of machines to farms, and with their use in various small industrial activities, we see in the small centers accidents that are really worse than those seen in the large industrial centers, because in the latter the patient has the advantage of prompt first aid. In the scattered districts this prompt rendering of first aid is impossible.

In a fracture such as this it is a wonder that more harm was not done to the nerves and blood vessels at the time of the accident. Dr. Campbell rightfully applied skeletal traction because he could not obtain sufficient traction with adhesive tape, and the roentgenograms gave evidence of an excellent result. This patient has a little shortening, but a lift in the heel will make up for it. He has, however, a slight varus deformity. In the medical schools I think more emphasis is placed on valgus deformities than on varus. A persistent varus is even more disabling than a slight valgus. As I question this patient I find that his foot is steadily improving. If it were not, I would suggest that under an anesthetic his foot be manipulated to break up adhesions in the middle of the foot. There are undoubtedly some adhesions in the region of the tarsal bones, and often brisk manipulation under an anesthetic, and forcing the foot over into slight valgus, and holding it there in a cast for a week or two, hastens improvement.

Case VI: Arthritis. (Dr. E. G. Sasse.)

O. LaF., aged 23, has a negative family history and was apparently in good health until about ten years ago, when he complained of occasional pains in his left hip which would last for a few days and then disappear. About five years ago the left ankle became swollen and more or less painful. This swelling never disappeared but remained stationary. About four years ago the left knee became swollen and a year later a similar swelling appeared in the right knee. After about ten months he consulted a physician in St. Paul, who kept him under observation for two years and during this time operated on both knees. The tonsils were removed four years ago and no other focus of infection could be found but the disease remained slowly progressive and has involved the wrists and there is some limitation of motion in the jaw. His knees are now shown fibrous ankylosis and he cannot walk without crutches.

Dr. Henderson: This young man has a slowly progressive type of arthritis of atrophic type. He has had trouble for ten years and has had good treatment; nevertheless the disease has progressed. However, this does not mean that the disease will not become quiescent ultimately, although the patient may be left with some residual deformity.

In recent years, ganglionectomy has been applied in these cases. In some instances this attack on the sympathetic nervous system has afforded brilliant results, but the cases for which it is suitable are very few. Ganglionectomy is used in the atrophic type of arthritis, when the disease is confined to the hands and feet; it has little effect on disease in the hips and knees. It helps only insofar as it increases the vascularity of the part and does away with the cold, clammy, sweaty condition of the hands and feet.

This patient has undergone synovectomy of both knees, and undoubtedly it has helped him. He has trouble now in the ankles, but unfortunately synovectomy is not a practical procedure to apply to the ankles, because of the structure of the ankle joints. I believe that it is important to keep up motion in these cases, and to encourage the patient to use the limb to the point of tolerance. Physiotherapy, consisting of baking, massage and contrast baths, can be carried out at home at no expense; very few of these patients can afford the luxury of physiotherapy applied by a professional person.

Case VII: Fracture Left Femur and Fibula. (Dr. C. J. Meredith.)

O. S., aged 41, on September 16, 1931, fell off a farm tractor and was run over by the plow.

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Pediatric Clinic*

F. C. Rodda, M.D.
Minneapolis

IT STRIKES me that the cases that have been collected for this clinic call for an endocrinologist rather than a pediatrician. On second thought it occurred to me that giving clinics before state groups is becoming a harder task all the time. The easy cases we used to have, the simple feeding cases and the cases of scurvy in which we could acquire marvelous cures by the feeding of orange juice, have passed. All the cases now are complicated and obscure. I am sure that the pediatrics being practiced in the Northwest now is very high grade indeed, and what works out to the disadvantage of the man giving the clinic works out very well to the credit of the men giving the medical care.

Dr. Campbell will read the first case history.

Case I—Cretinism? Mongolism?

J. T., aged two years and 11 months, is the youngest child in a family of seven children. The delivery was normal, birth weight ten pounds. At the time of his birth the father was forty-eight and the mother forty-five years of age, both in good health. One child was stillborn four years previous to the birth of this patient, having been delivered by a midwife. All the other children are normal and healthy.

The patient has had numerous "colds" and bronchitis, and on October 16, 1932, developed a right-sided lobar pneumonia, which cleared up under the usual hospital treatment, including diathermy. During this illness he first came under the care of Dr. Campbell. Previously he had been under the observation of Dr. James of Page, and in April, 1932, thyroid extract, one grain daily, was started and had been continued ever since. Dr. James stated that at the age of three months the child developed the typical cretin facies.

In October, 1932, apart from the typical facies, he presented the short fat hands and feet and excessive fat in the supraclavicular regions. The abdomen protruded, the anterior fontanelle was still open and there was conjunctivitis. The teeth were developing normally, the tonsils were slightly enlarged.

On October 30, 1932, the dose of thyroid extract was increased to two grains daily and he was also given cod liver oil and orange juice, as well as a liberal diet.

On November 29, 1932, his weight was thirty-four pounds, and about this time he had bronchitis of short duration. On April 27, 1933, he again had bronchitis and laryngitis, which improved after a week in the hospital.

On May 17, 1933, the weight was thirty-five and a half pounds, the pulse 102. The child was in good physical condition and was taking two grains of desiccated thyroid gland daily. A radiogram of the hands showed three centers of ossification for the carpal bones.

This child did not walk until he was 27 months of age, and at present his vocabulary is confined to gutteral sounds.

Case II—Mongolism. (Dr. William Campbell)

A. U., aged six years and seven months, is the youngest in a family of four boys. The delivery was normal. At the time of his birth the father was thirty-nine and the mother thirty-eight years of age, both in good health.

At birth it was noted that the eyes slanted and there was a distinct epicanthus. The fontanelles were large and there was a bulging above the level of the fontanelles during the first year of life. The fontanelles closed when the boy was about two. He was breast fed, supplemented with bottle feeding, with cod liver oil and orange juice.

During infancy he was sluggish, cried very little, did not recognize objects until the age of seven months, was able to stand at fourteen months and walked at twenty months. The first tooth appeared at fourteen months.

The child has been subject to frequent colds and bronchitis; his appetite and digestion have been good. In 1932 he was circumcized and a tonsillectomy and adenoidectomy were performed.

Mentally he is active and always cheerful and alert but not normally intelligent for his age. He is mischievous, stubborn, likes to tease and is imitative. He can be reasoned with and shows bad temper only for a real cause. His vocabulary is limited to about twenty words. He has been trained to go to the toilet. He is very well looked after by his parents and has been trained to dry dishes and dust the furniture. He is unable to

*Informal clinic at the Forty-sixth Annual Meeting of the North Dakota State Medical Association, Valley City, June 1, 1933.

button his clothes, and recognizes no danger. He sleeps curled up and is restless during sleep.

Examination shows that he is large boned and ungainly in appearance, with large "cauliflower" ears. His mouth hangs open; the eyes slant but epicanthus is no longer present. The palate is very highly arched and narrow. The permanent first molars and incisors are present, the incisors being notched. The abdomen is protuberant and the feet are flat.

DR. RODDA: I will be very well pleased if I can assist in getting fixed in your mind the characteristics of this disorder.

This first child has a difficulty known as mongolism which, unfortunately, is confused with cretinism. We have not a definite cretin to show you but have one of a type which may help out. Let me point out some of the characteristics of mongolism. These children are all as alike as two peas.

First, is the facial expression. They are usually very good natured; they are bright, sunshinny, and have an animated expression of the face. If you note the eyes the palpebral fissures slant downward toward the mid line and at the inner angles have definite epicanthic folds. These children breathe with the mouth open and have chronic upper respiratory infection. The tongue has a beefy appearance and there is nearly always a large amount of dental decay.

The point that has helped me out in some of the borderline cases is the shape of the head. It comes right up from the neck, almost straight up, with no occipital protuberance.

There is nearly always poor muscle tone. They may be fairly well nourished but nearly always are weak. The hands and feet are peculiarly shaped, short, stubby, and very often there is an incurving of the little finger. This child shows this nicely. They can do things that the normal child cannot with its joints which are abnormally lax. These children nearly always perspire excessively in the summer time and are nearly always subject to heat rash. The sexual development is about normal. The circumference of the head is commonly less than that of the normal child, 46.5 cm. in this instance.

An X-ray picture of the hands and wrists is of great assistance. It shows, two or three centers of ossification. This would not be true if the child were a cretin.

This second boy has somewhat the same expression of the face and the head is about the same shape although there is a little bit of protuberance over the occiput. He has the same stubby hand and the little incurving finger. This child's joints are exceedingly relaxed, more so than in the first child. Again we have the upper respiratory infection, nasal discharge, severe dental caries, and a large beefsteak looking tongue.

These cases furnish us, unfortunately, about two per cent of the referred work that comes to us. We cannot do much for them and the picture is so clear-cut that it is not necessary to refer these patients. All men should be able to pick them up and recognize them as Mongols.

What do we know about the etiology of this strange type of disease? It is called mongolism because the children have facies somewhat like the Mongolian race. There are many theories. It was first thought to be luetic but that is not true for the percentage of lues in these children is no greater than in the average children. Alcoholism has been accused but I think that is not true for these cases occur in families in which alcohol never is used. Then it was thought that this disorder affected the last child in a large family and this does sometimes occur but just as often it is the first child, and of young parents. I have seen such cases when the mother was 19, 20 or 21 and the father 26 or 27. Then it was supposed to be due to some dysfunction of some of the glands of internal secretion but no one has ever been able to prove this. There have sometimes been results from the use of thyroid extract, as in cretinism, but not lasting results. It is now thought to be a throw back, so our etiology is entirely obscure, we don not know what causes it.

We are interested in the treatment—what is the prognosis? I called attention to the fact that there is nearly always upper respiratory infection, nasal discharge, and one child here had a definite pneumonia. That is typical of these children. They are slow to develop, slow to walk and talk, and that is the history in all these cases. The vast majority of these children die at four or five years of some upper respiratory infection. They may progress to a mental age of a child two, three or four years of age. Rare cases reach adult life and attain the mental age of a child of 12 but they can assume no responsibility, do not recognize danger, and in all respect are mentally incompetent.

Have we any treatment? Perhaps one thing might be done in the way of prevention of respiratory infections. All of these children have large tonsils and adenoids. Removing this may ward off some of the infections but in no way way will it affect the child's development.

As to drugs, we have tried pituitary extract and thyroid extract but have had no good results. Sometimes certain children have spurts of improvement but it is not due to the administration of a drug. However, doing something is better than sitting with folded hands and if you administer thyroid and pituitary therapy properly you have the satisfaction of doing the best you can at present.

Question—What is the pathology?

DR. RODDA: Nothing very definite. Commonly the skull is small, the cortical convolutions are shallow. There is no definite pathology in the blood or nervous tissue.

ORTHOPEDIC CLINIC

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Examination revealed contusion and abrasions over the chest, shoulder and head; a lacerated wound over the lateral surface of the right thigh which extended down to the bone; fracture of the left fibula in the lower third, and an impacted fracture of the neck of the left femur. The leg was put up in a Thomas splint with adhesive plaster extension.

In six weeks the leg was removed from the splint. Roentgenograms showed the position to be excellent with apparently fair union. There was a half inch of shortening.

For economic reasons the patient was unable to remain in the hospital. He was sent home with the advice to remain in bed three months and then get up and walk with crutches.

On March 26, 1932, he reported by letter that the leg was all right. He did not report in person until April, 1933, at which time there was a marked limp, two inches of shortening and considerable pain in the hip. Roentgenographic examination showed a bad deformity.

At this time he confessed that he got up on crutches two weeks after leaving the hospital, lost his balance and put weight on the injured leg. He experienced severe pain, but after remaining in bed for two days, was up on crutches again.

Dr. Henderson: The patient is only forty-three years old, and this is young to have a fracture of the neck of the femur. He has a result which is not pleasant to see. It is not the result of faulty treatment, but of the patient's putting weight on the leg too soon. He did this contrary to his physician's orders. At the time of the mishap which accounts for the poor result, the patient experienced sudden pain, but he failed to consult his physician; therefore, the opportunity for correction and further fixation passed.

In treating a fracture of the neck of the femur patients should be anesthetized, the leg brought down to normal length, held in abduction, and the foot somewhat inverted. This locks the fragments but then some means to hold them should be taken and the best is to use a plaster of paris spica cast. If it is a single spica it should extend high onto the chest. If it is desired to use a low spica, then the opposite leg must be included down to the knee.

There are different ways of treating these fractures and the most recent method is that brought forward by Smith-Petersen of Boston, who uses a flange nail. He claims that by this method he can get his patients out of bed in two or three weeks and have them on crutches soon after that. This is encouraging, but I think we must wait for a further report from Smith-Petersen, which I know will be forthcoming because he is a careful and accurate observer and reports his cases.

This patient has some motion in the hip; there is no ankylosis. From the roentgenogram I cannot tell whether there is bony or fibrous union, but I think it is fibrous. If his disability continues there are several courses open. The head could be excised as in Whitman's reconstruction operation, which would give skeletal support by putting the upper end of the femur in the acetabulum. However, for a working man this is not very satisfactory, and I believe in this instance that if the disability continues arthrodesis would be most useful. It is possible that he may obtain firm enough fibrous union to give good function.

The Surgery of Coronary Disease

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THE surgery of angina pectoris is unique in that it has been delayed in its development, not by lack of knowledge of the pathological process, but by lack of accurate anatomical knowledge concerning the structures involved. It is only recently that the work of Mandl, Kuntz, White and others have definitely established the nervous pathways concerned with the cardiac mechanism, thus making possible direct surgical attack against the symptoms of this disease. In most instances the most successful surgery is that which is directed at the disease itself and which attempts the eradication of the disease itself or at least restoration of function. It is unfortunate that coronary disease is not amenable to this phase of surgical treatment. It is obvious that a vessel once occluded by thrombus or embolus or simple mural thickening cannot be restored to function surgically. In that other group of cases, however, which perhaps more properly deserve the term "status angiosus" in which there is no permanent obstruction to the coronary circulation, but in which there is claudication and its attendant phenomena due to narrow lumina the result of sclerosis or vaso-spasm, it would seem that some direct action might be taken against the vaso constrictor nerves, but unfortunately the work of Anrep and Seegal shows that the vaso constrictor fibers of the coronary circulation traverse the vagi and that nothing short of bilateral vagal section will produce dilatation of the coronary vessels. While it is possible that thyroidectomy as recommended by Blumgart may accomplish this end in this latter group of cases, certainly no other type of surgery is curative or can be directed against this phase of the disease itself.

The field of surgery then is limited to the treatment of symptoms arising in angina pectoris and of these it may be effectively employed for the control of the recurring paroxysmal pain. Aside from the pain arising in the root of the aorta the pain in angina pectoris is due for the most part to anoxemia of the cardiac muscle. This is probably augmented by spasm of the coronary vessels itself. The pathways by which pain stimuli are conducted have been subject to speculation for some time, but only with the work of Kuntz, Morehouse and White have they become known with any degree of certainty. From the region of the cardiac plexus, the three main cardiac nerves pass upward to join the superior, the middle, and the inferior cervical ganglia respectively. Of these the pain stimuli traverse only the middle and inferior nerves. Extending laterally from the region of the cardiac plexus are sympathetic afferent fibers communicating with the second, third, fourth and fifth ganglia and passing to the corresponding posterior spinal nerve roots by way of the white rami. From even this very brief description the divers channels by which pain stimuli may arise to consciousness can be readily appreciated. For surgical intervention to be effective it is necessary that not only the cervical ganglia be extirpated or blocked, but that the succeeding five thoracic ganglia be also dealt with. The pioneer work in this field was done by Jonnesco followed by Leriche and Danielopulu and has been brought to its present status largely through the work of White and Swetlow. At the present time surgical treatment of angina pectoris consists of the blocking of pain stimuli either by removal of the appropriate sympathetic ganglia or by their destruction by means of alcohol injection. Realizing that extensive ganglionectomy was by far too serious and formidable a procedure to be employed in any but very few cases, White following the lead of Swetlow was the first to practice extensively alcohol injections of the sympathetic ganglia. In this manner he has been able to obtain excellent results in fully 50 per cent of the cases treated and to materially improve 30 per cent. While the risk attendant upon this form of treatment is negligible and it appears very simple, it nevertheless involves a rather difficult and exacting technique. Because of the location of the ganglia and the absence of sufficient fixed anatomical landmarks, technical errors of injection are frequent. Because of this and the consequent high percentage of failures and the frequent complications, I have modified this procedure without, I believe, increasing the risk to the patient.

Under local anesthesia a five inch incision is made along the cervical transverse processes in such manner as to expose them from the first to the sixth dorsal, this comprises the first stage of

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Clinical Notes of the Interstate Post-Graduate Assembles 1932 European Tour

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OUR party sailed from New York May fourteenth on the Mauritania. Owing to the depression the party was small. This was lucky for us as it is easier for a small party to see clinics in Europe than it is for a crowd.

We stopped for a few days in Paris and while there visited the Pasteur Institute. We were taken through the buildings housing the tuberculosis section where only work on the tubercle bacilli is done. It is a large, four story building, an endowed institute connected with the Pasteur Institute. They have a large number of animals for experimental work, including a separate building where they maintain about fifty monkeys. They have an Institute in Africa which keeps them supplied with monkeys at all times. The Professor, who showed us around, is a chemist and is interested in the chemistry of the tubercle bacillus. He had six grams of live tubercle bacilli growing in his laboratory. We were not allowed to go into the room where these bacilli were growing because he said it was dangerous. If we stayed in there for a few minutes only, we would be sick for days. When he first started this work he became very sick but now he has become immune. It is particularly dangerous because live bacilli are used and frequently some of the laboratory workers become infected. Last year one of his colleagues died from tuberculosis contracted in the laboratory. They are now working on the chemistry of the tubercle bacilli and already have isolated some of the toxic and non-toxic substances. Most of the toxic substances are contained in the fats, sugars, and salts of the bacilli, practically none in the proteids. He had a room full of guinea pigs, rabbits, and mice which were used for experimental purposes, and they do about one dozen autopsys a day on these animals. Calmette's vaccine was manufactured in this laboratory. This so-called "BCG" vaccine is distributed throughout France at the rate of about six hundred packages a day. They have been using this vaccine since the time of Calmette. It is administered in one dose during the first or second day of life and is given by mouth in milk. It seems to be very successful. They are able to immunize guinea pigs to very large doses of tubercle bacilli.

At the Pasteur Institute proper they showed us the tomb of Pasteur, the rooms in which he lived and the laboratory with the original apparatus just as he left it. There stood the vial with the first sterile solution ever produced. Pasteur was not a doctor but a chemist. One of his early patients still works in the Pasteur Institute.

On our round of sightseeing in Paris we visited the tomb of Napoleon in the Invalides. After seeing the modest tomb of Pasteur in a little nook in the Pasteur Institute, we could not help but compare it with that of Napoleon.

We visted the Curie Institute where they have thirteen grams of radium. Madame Curie is not in good health and was therefore unable to see us. They have about two hundred patients, all of whom are selected cases for experimental purposes only. They treat only cancer of the superficial parts of the body. At the present time they are using massive doses and are experimenting with the use of radium used like X-ray, using massive doses at a distance of about one foot.

We visited the clinic of Dr. Faure, professor of gynecology. He is a man sixty-seven years of age, a very clever surgeon and a swift operator. He did a subtotal hysterectomy complete in eight minutes and a complete Wertheim operation in forty minutes. He is a surgeon of the old school and has marvelous technique. He had only one assistant and no clean nurse. All of his instruments were in a pan, and he looked after them himself. The skin was painted with strong iodine. A self-retaining retractor was placed under the patient's buttox. All of his sewing was done with the Reverdin needle using heavy silk through-out. He said the American doctors are foolish in not using this needle. His methods have not changed for years. They are copied after those of Dr. Kelly of Baltimore.

Dr. de Martel is one of the best known surgeons of Paris. He is not connected with the University. He refuses to operate by daylight and the curtains are always drawn tight in his operating room. He wears a headlight, thus he is not entirely dependent on the overhead lights. He does not scrub his hands but pulls on a long rubber gauntlet glove which is scrubbed thoroughly both in water and alcohol. A pair

of sterile cotton gloves are pulled over the rubber gloves.

His method of subtotal hysterectomy is ingenious. It is a modified Kelly operation. By means of a screw introduced into the fibroid, strong traction is made on the uterus. After liberating the rectum and the bladder, the neck of the uterus is amputated so as to separate the cervix from the fundus; this allows him to make traction on the broad ligaments and appendages before they are ligated and cut, making this part of the operation very simple as he is able to deliver the broad ligaments out of the pelvis. All of his operative procedure is well standardized.

In doing a posterior gastroenterostomy he uses a clamp on the stomach but none on the duodenum. The anastomosis consisted of two rows of silk sutures. The abdomen was closed in layers by the use of the Reverdin needle. This is a very popular needle through-out France and Italy.

Dr. de Martel did a case of gastric resection for cancer of the stomach using a three blade clamp of his own invention so arranged that by removing the middle blade, he was able to incise the stomach between the other two without soiling.

Dr. Gosset is head of the department of gynecology at De Sal Petriere. He is a man sixty years of age and is a very fine surgeon. He uses a Balfour retractor, which he said he invented thirty years ago.

His gallbladder operation was done through a median incision. After removing the gallbladder a drain was put in the cystic duct. He is a very swift operator and his method of opening the abdomen was different. His first cut exposed the fascia which was grasped on either side of the incision with strong forceps, then forcibly lifting up the abdominal wall, he made his next cut which invariably penetrated the abdomen without endangering the viscera. The closure was made with interrupted silk sutures using the Reverdin needle.

Our party spent a pleasant afternoon at a reception at the American hospital given by Dr. Gros who has been Superintendent of the hospital since the war. The American hospital was built before the war by Americans living in Paris. During the war it was used as a base hospital. It is situated in the outskirts of Paris on a beautiful wooded knoll overlooking the city.

From Paris our party travelled by train through the heart of France to Marseilles. We spent the night at Nice. The next day we took the beautiful Grande Corniche drive along the Riviera to Monte Carlo where we all had an opportunity to try our luck.

We spent a night at Genoa. The next day we visited the little ivy covered house which was the home of Columbus. That afternoon we took the train to Rome. No country in Europe since the war has witnessed greater changes than Italy under Mussolini. People are all working and seem satisfied and contented. Mussolini has done wonders for the Italian nation. The Facisti party is in control and there is no opposition party. Our guide would talk of politics only in a whispered breath.

At Rome we visited the clinic of Professor Ernst Pastalazza who is a gynecologist. In doing his pelvic operations he uses a modified Trendelenburg position. The knees were flexed and fastened to the upper part of the table so that the body was absolutely in a vertical position. The anesthetist sat on the floor and the surgeon sat in front of the patient while operating. It is certainly a convenient method for the operator as the bowels seem to absolutely disappear from view. A large screw was used for traction on the fibroids, using heavy silk sutures throughout the operation. He stated that the sutures last for one or two years before they are absorbed. At this clinic, cotton gloves were used under the rubber gloves rather than over as we had seen it in Paris. Most of his pelvic work was done through a transverse incision. In doing perineal repairs a stream of water was used to keep the field clear of blood. Dr. Pastalazza is seventy-two years of age and is to retire at seventy-five.

At the clinic of Dr. Allessandri we were shown his method of treating osteomyelitis by primary closure. This method is used also for the treatment of giant celled tumors and bone cysts. He showed us X-rays of several successful cases. His method consists of first cleaning out the cavity thoroughly, then filling it with iodoform and plaster of paris. The wound is closed without drainage. He reported ten cases. This method is used only in chronic cases. The most successful cases are those where germs are few in number. The plaster is sterilized by dry sterilization, then ten per cent iodoform is added. He claims that the plaster absorbs rapidly. Sometimes the cavities are cauterized with carbolic acid and iodine before the plaster is introduced.

Dr. Alessandri is very fond of spinal anaesthesia, using tutocaine. His method is unique. First 50 cc. of spinal fluid is withdrawn, then with another syringe he withdraws 10 cc. more; this latter is mixed with tutocaine and reinjected into the spinal canal. The 50 cc. first removed

is injected into the blood stream in the vein of the arm. He claims that this method prevents shock. The method is described by a Romanian surgeon.

One cannot go to Rome without spending several days sightseeing. Several of our party had audience with the Pope. The Pope passed rapidly along the line paying no attention to the individuals. He seemed to glide from one person to the next. The ceremony was very short.

Our party visited Naples, but only for sightseeing purposes; no clinics were given there. We made an excursion to the top of Mount Vesuvious just across the bay of Naples. We also visited the ruins of Pompeii and Herculaneum which were destroyed in '79 and '80.

We spent a few days sightseeing in Florence which is one of the most beautiful cities in Italy. It is the cultural center of Italy and has a large American colony.

At Milan we attended the clinic of Professor Donoti at the University hospital. His technique is similar to that used in the United States.

Dr. Alafredo, Professor of gynecology and obstetrics, used a complete vertical Trendelenburg such as we had seen in Rome. He sutures his towels to the peritoneum after the abdomen was opened. Picric acid was used on the skin. He removed the uterus by first cutting the broad ligaments, then amputated the cervix. His technique was very similar to our own, even to the use of the Mayo table. The round ligaments were shortened by a method of his own which differed slightly from the Baldy Webster in that he tunneled the muscles on the posterior side of the uterus under the broad ligaments where the round ligaments were grasped, pulled through and fastened to the posterior surface of the uterus.

While in Milan we visited the famous painting of Lenardo da Vinci's "The Last Supper." It is painted on the plaster wall of an old monastery, however, it is doomed to destruction as the plaster on which it is painted is slowly crumbling. Some of the figures now are very indistinct.

At Berne, Switzerland, we visited the clinic of Professor Guggisberg. We saw him remove an enormous multilocular cyst containing forty liters of fluid. His patient was an insane woman. The tumor was evidently malignant as it was adherent to the bowel and he was obliged to leave some of the cyst wall attached to the bowel.

His second case was a Caesarean in a woman suffering from nephritis. In these cases he gives a salt free diet and fruit juices as post-operative treatment. His Caesarean was done through a transverse incision controlling the bleeding by injecting pituitrin into the uterine muscles. He made a very small low incision into the uterus. After introducing his hand, he found there were twins. They were delivered by version. He claims that the cases of albuminuria is increasing in Switzerland. He seldom operates on cases of retroflexion and when he does, it is usually on account of sterility.

The forests of Switzerland are mostly of beech and fir trees. These are mixed for the purpose of fire protection. It is said that the first beech trees were planted to provide stocks for guns.

We visited the House of Parliament which meets three times a year. Each member gets six dollars a day while in session. The President receives $7,000 a year and is elected by Congress for one year only. He may be re-elected but must not follow himself in office. There are seven ministers; all are elected by the Legislature. One of the seven must be Catholic, two must be French. Parliament is elected every five years, all at one time.

They have a military school for cavalry at Berne. Each enlisted man must have a saddle horse. When he leaves school he takes his horse with him and is allowed to use the horse on his farm.

On June eleventh we attended the clinic of Professor De Quervain at the University Hospital. In honor of our society he gave his talk in English. He taught somewhat after the manner of Dr. Murphy, calling students into the pit to examine the patients.

We were shown seven cases of cretinism; three of them were due to cystic goitre, three to an atrophic type, and one to mongolism. They have five to six hundred cases of cretinism in Switzerland. They are rapidly decreasing due to prophylactic treatment of children. He showed us films taken at the Institutes surrounding Berne where the cretins work on farms. Dr. De Quervain does not operate on adenomatous goitres except for pressure symptoms. Thyroid extract is given in preference to thyroxin. They have seven per cent malignancy of goitres in Switzerland. He operated on several cases. His first was an adenomatous goitre in which he did a primary ligation of the inferior vessels on each side before ligating the vessels in the gland, then removed the goitre using a diathermy knife. Glass tubes were used as drains and clips were used for the skin. The operation was done under local anaesthesia. The upper flap only was reflected, the superior thyroid artery was ligated twice, then cut so as to mobilize the gland. His technique in all of his goitre work was the same.

His second case was that of a woman with jaundice of three weeks' standing. She had an enormous gallbladder about eight inches long. The common duct was dilated to the size of a garden hose. He mobilized the duodenum after the method of Kocher by cutting the outer leaf of the bowel. After lifting the duodenum he found cancer at the head of the pancreas which was inoperable. The abdominal packs used consisted of two layers of gauze with a rubber sheet between, to prevent leakage through the pack. He anastomosed the gallbladder to the stomach in the most clever fashion I have ever seen by first placing two rows of interrupted sutures between the gallbladder and the stomach in a semi-circle around the point of anastomosis, then fulgrated an area about one-half inch in diameter over the stomach and a similar area over the gallbladder where the opening was to be. He did not fulgrate entirely through either viscus but, after the tissue was thoroughly blanched, completed his two rows of sutures, and the operation was finished without any possibility of contamination. He said the cauterized area would slough through in three to four days.

At Zurich we had a lecture on eclampsia at the University Frauenklinik by Professor Walthard. He showed us charts illustrating the decrease of mortality of both mother and child in his clinic since 1884. He lays this improvement largely to the use of Caesarean section and to transfusion. He removes the patient's blood and replaces it with transfused blood.

Professor Walthard believes that cases of puerperal sepsis are due to endogenic infection of the blood of the patient and not from contamination during delivery. When he places the pregnant mother in the hospital for eight weeks preceding delivery, thus preventing intercourse, cases of puerperal sepsis occur less frequently than when these women are allowed to stay at home.

He has made research as to the prevention of thrombosis following an operation or confinement. His theory is that it is due to a diminished flow or stasis of the blood stream allowing the blood platelets to cause thrombosis. In his earlier work his experiments were directed to the blood stream itself. These were not satisfactory, but as soon as one uses exercises and methods of increasing the blood pressure causing a more rapid flow of blood, no clots form. He has instituted a method of exercises consisting of gymnastics and Swedish movements which he starts at once after a pelvic operation or after childbirth. His statistics show that embolism is much less frequent when gymnastic exercises are systematically performed three times daily after an operation or confinement. One of his English speaking nurses demonstrated these exercises on a patient in the ward.

(Continued in February 15 Issue)

THE SURGERY OF CORONARY DISEASE

(Continued from Page 60)

a cervical sympathectomy. With easily located and easily recognized landmarks, it is possible to quickly and accurately reach the ganglia with the needle point and with a minimal dosage of alcohol obtain what to all intents and purposes is a cervical ganglion extirpation. Besides insuring a higher percentage of successful injections, this procedure also insures fewer complications such as pleural irritation, vessel injury, or spinal nerve injury. The most annoying and discouraging complication which may follow an excessive or misplaced injection of alcohol is a spinal nerve irritation which manifests itself as a persisting and severe intercostal neuralgia. This condition may persist for several weeks or months and it may require posterior root section for relief. While the foregoing treatment or any similar treatment is effective in the abolition of pain in coronary disease, it is by no means indicated in all cases. Surgery is particularly indicated in those cases in which the pain is severe, recurring and wholly disproportionate to the degree of cardiac damage.

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A Review of the Causes of Reactions Following Intravenous Injections of Glucose and Normal Saline

Kent E. Darrow, M.D.
Dakota Clinic
Fargo, N. D.

THE value of intravenous injections of glucose and salines is so great and covers so many conditions that reactions following their use should be kept to a minimum. Many of the patients are desperately ill and a severe reaction might be the extra straw. On the other hand, I am sure that at times it is the main stay to tide the patient over and save the life.

We were getting too many reactions and could causes that we could think of,but still had reaccauses that we could think of but still had reactions.

I then saw an article on this subject by Samuel A. Thompson in the American Journal of Surgery, that brought out a cause of the reactions that I had overlooked. A search of the literature then brought out the fact that we had been overlooking the commonest cause of the reactions, namely, contaminated distilled water. To bring this cause to the attention of those who have overlooked it, I will use Dr. Thompson's paper as a basis for this review.

Causes of Reactions

Among the many theories advanced as to the cause of reactions are:

(1) Chemically impure glucose and sodium chloride may give reactions, but the reactions do not consistently occur.

(2) Rubber tubing. This is probably only a casual factor, as injections have been given with the proper distilled water, which has been boiled with fresh rubber corks until it smells of rubber, but still without reactions.

(3) Impurities from glassware. Impurities may be absorbed from soft glassware used in the still to collect the water, or in the final containers.

(4) Impurities from metals. Copper, zinc or nickel should not be used in the condensors of the still, as these metals may be absorbed and give reactions. Block tin is O. K. as is hard glass.

(5) Temperature of the solution. The temperature in itself will not cause reactions between 20 C. and 42 C. If solution is too hot, patient complains of burning at site of injection and solutions below 20 C. cool the blood too much. The best temperature is between 100 and 110 at the vein.

(6) Improper sterilization. Glucose sterilized at too high a temperature will cause carmelization which sometimes causes severe reactions.

(7) Foreign bodies in solution. If gauze or cotton plugs are used, particles may become detached and drop into solution. It has also been shown that in breaking ampoules, fine pieces of glass are found in the solution; as many as 200 pieces have been found, and these usually are small enough to go through a 20-gauge needle.

(8) Rate of injection. There is no uniformity or standard as to what constitutes a slow or a fast rate of injection; slow might be anywhere between two cc. to 60 cc. per minute. Reactions are not likely to occur at rates of 1,000 cc. per hour or any slower speed.

(9) Low grade filter paper. Poor paper may contain starch bodies and loose fibers, which might give reactions.

(10) Individual susceptibility to glucose.

Many of the above causes are important and should be taken into consideration; however, by far the most important are the following causes which we had overlooked and which I now call to your attention.

(11) Contaminated distilled water. As early as 1923, Florence Seibert in the American Journal of Physiology called attention to a substance commonly found in ordinary distilled water that produced fever. This was called pyrogen. Pyrogen is a protein derived from a certain group of water bacteria described by Jordan as group X and XI of river bacteria. It is soluble, filterable and resistant to boiling. The presence of large numbers of other bacteria does not produce pyrogen or render the water pyrogenic. This substance readily passes over with the distillate in an ordinary still unless a water spray trap is used. Repeated ordinary distillation fails to remove it as does sterilization or passing it throuph a Birkefeld filter. A single proper distillation with a water spray trap, however, will remove it completely.

As the properly distilled water may be easily contaminated and develop pyrogen rather quickly,

it is important that the water be sterilized and sealed immediately after distillation, when it will keep almost indefinitely. Rademaker confirmed this work in 1930, Annals of Surgery.

(12) Hydrogen ion content. It has been shown that solutions of an alkaline PH gave more reactions than those of acid PH. Normal distilled water is slightly on the acid side. The alkaline solutions that gave reactions were buffered to a low PH and still gave reactions. Non-fever producing acid solutions were then buffered to high PH without giving reactions, proving that the PH in itself did not cause the reactions. The alkaline impurities that caused the high PH were proved to be the pyrogen bodies. This again proves the importance of the elimination of the pyrogen.

Elimination of the Causes

(1) Use only C. P. standard drugs of at least U. S. P. standards. The only reactions we have had since we eliminated the pyrogen from the water were three that occurred when they ran out of the C. P. glucose and got some bulk glucose locally. No reactions occurred when C. P. glucose was again used.

(2) Use only pure gum corks and tubing and, if new, wash with soap and water and rinse with distilled water and then soak in four per cent sodium hydroxide one hour. Wash thoroughly and soak in distilled water before sterilizing. No tap water should be used after the original washing, then only pyrogen free distilled water.

(3) Use only hard glassware, Yena or Pyrex.

(4) Still should be block tin or glass lined.

(5) Give solution at from 100 to 110 at the vein. About 120 in the container will usually be the right temperature at the vein.

(6) Glucose solutions properly prepared and filtered at least five times through French filter paper are autoclaved without a vacuum for forty minutes at five pounds pressure. High pressures and therefore temperatures cause carmelization. Salines can be autoclaved without vacuum for 20 minutes at 15 pounds pressure, if desired, or the same as the glucose.

(7) Cotton or gauze plugs should not be used in flasks unless part of plug is covered with unlacquered cellophane paper. When glass ampoules are used, allow a little time to elapse after opening ampoule to let the glass particles settle in the bottom.

(8) Never inject faster than five or 10 cc. per minute. Concentrated solutions should be injected slower than more dilute ones.

(9) Use only high grade filter paper.

(10) Individual susceptibility is fortunately very rare and we know of no practical method to eliminate it.

(11 and 12) Use only pyrogen free distilled water that is sterilized fresh from the still. Use a water spray trap in still. Test for pyrogen. The test is as follows:

Heat 100 cc. of distilled water to boiling point in a clean pyrex beaker that has been rinsed in the distilled water. Acidulate with 10cc. of 10 per cent sulphuric acid, then add one-tenth of one cc. of twentieth normal potassium permanganate and continue boiling for ten minutes. The faint pink color should remain in the solution if no pyrogen is present. If there is any pyrogen present, the color will disappear, as pyrogen is a reducing body.

Since using pyrogen free distilled water and following the above precautions, we have had no reactions whatever except the three mentioned which were due to impure glucose.

Conclusions

Use all the precautions to prevent reactions from all of the causes given. The majority of reactions are undoubtedly due to pyrogen contaminated water.

The
JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA, *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

North Dakota State Medical Association
South Dakota State Medical Association
The Hennepin County Medical Society
The Minnesota Academy of Medicine
The Soo Railway Surgical Association
The Sioux Valley Medical Association
North Dakota State Health Officers' Assn.
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LANCET PUBLISHING CO., *Publishers*
M. E. Herz, *Business Manager*
84 South Tenth Street, Minneapolis, Minnesota

W. L. Klein, 1851-1931

MINNEAPOLIS, MINN., FEBRUARY 1, 1934

A WARNING

National economic changes that are revolutionary in character are greatly affecting and influencing the practice of medicine and surgery.

The majority report of the committee on the costs of medical care, and the emergency in this depression that necessitated the action of the Federal Government in furnishing medical care for the indigent, as well as caring for millions of Federal employees, has materially robbed the general practitioner—the "bulwark" of the medical profession—of the physician-patient relationship that has been so important in the past.

The work of the Federal Government must be treated as an emergency, and, if the relationship of the physician and the patient is to be maintained, the leaders in the profession, as well as the societies, both state and national, must be ready with a vigorous constructive program to prevent health insurance and state medicine from creeping into the picture on the heels of this so-called emergency.

This action is necessary to prevent the emergency from relegating the general practitioner to the status of the "hired man," both socially and financially.

E. W. J.

AN ENCOURAGING OUTLOOK

We have seen figures which indicate that the government is going to send $626,750,000 in relief money into this territory. By this territory we refer to the four states that this Journal purports to serve: Minnesota, North and South Dakota and Montana.

Total loans to farmers	$248,705,810
Total bank and home loans	23,120,265
Total farm relief plans	88,878,577
Total relief and works	125,526,557
R. F. C. funds	134,492,134
Post offices	6,030,000

It does not take a horoscopic reading nor great breadth of imagination to visualize the immediate results. This large sum of money poured into our section, cannot help but have its influence felt, even to the point where the patient and long suffering doctor will become aware of its benign effect. The northwest is getting a lot of money, not in one lump sum, mind you, but pretty well distributed so that it will trickle through the ordinary avenues of trade to the point where all will be affected, and the man of medicine will surely get a share.

A. E. H.

CHISELLING THE POOR

In every relief project are found three types of beneficiaries. There is the professional type, made up of the chronic "down-and-outers," the derelicts of society who are floating rudderless in the sea of human endeavor without hope or expectation of regaining anything like their proper places in the social fabric. These people constitute the nucleus around which or-

ganized relief is found, wherever people congregate anywhere on the face of the earth. They have existed since time immemorial and they are as much a fixed part of the earth's population as is the useful or productive majority. Quick to complain, difficult to satisfy and hard to control, they constitute a knotty problem which sociologists, psychologists and political economists have long sought to solve and remedy, without evidence of success. We must, therefore, accept them as a fixed responsibilty at least for the present and we are not now concerned with anything more than recognizing their existence and fulfilling our duty to them as fellow humans.

The second type is derived from the unfortunate people who have, especially in stressful times like these, temporarily at least, reached the end of their resources and are forced to seek relief. They are properly entitled to the consideration that humane impulse dicates and for them the resource derived from taxation and other sources of public revenue, as well as those resulting from private benevolences are provided and administered, always with the thought of maintaining the self-respect and preserving the potential earning powers of these people who have been caught in the maelstrom of economic stress, often through no fault of their own.

The third type represents a curious development of modern trend, the people who have some financial means but who, selfishly try to take advantage of the resources which have been provided for their less fortunate fellows. It is safe to assume that this class has been fostered and encouraged in its development by the efforts of our friends the sociologists in their desire to gloss over the stigma which is supposed to be attached to the receipt of public assistance. This sociological influence has extended much further than the field of public relief, so that we find it operative in the conduct of penal affairs, as well. Our present system of conducting prisons and workhouses is apparently based on the reformatory idea, praiseworthy enough in theory, but clearly not applicable without individual classification. In order to save the first offender the professional criminal is included in the program, so that prison life is made almost attractive. The real victims are their unoffending families.

But to return to relief proper, and this now includes not merely the furnishing of food, shelter, heat and clothing, but hospital, dispensary, home treatment and nursing. The point we are trying to make is, that all these forms of assistance belong purely and solely to the first two types of beneficiary and not the third. This last, the chiseler, can be fairly easily stopped in the food lines but it has been found increasingly difficult to keep him out of the free beds in the public hospitals. Every bed so occupied keeps out a worthy applicant and is being paid for by funds which never were intended for that purpose.

The medical profession has tardily awakened to the gravity of the situation and is making concerted efforts to find a remedy. It should be encouraged and supported by all right thinking people. Public opinion is being aroused. The taxpayer is becoming interested. But the true sufferers are the worthy poor, who are being cheated out of the facilities and relief which have been provided by a humane public.

G. C.

AN HONORABLE CODE

Voltaire once said "I was never ruined but twice, once when I gained a law suit and once when I lost one." The modern expression is, "If you win, you lose" and oh, how the mighty have fallen.

In many ways but always through legal machinations large fortunes have been piled up, only to crumble at the behest of other legal invocations.

The medical profession may not be immune to temptation but it is certainly escaping the scathing criticism and vituperation that is so freely poured forth upon so many others in high places at the present time. The explanation may be made, that we have not associated so intimately with "big business"; but that can scarcely be considered the true interpretation of our present comparative popularity. It is the often ridiculed and much maligned principles of medical ethics.

The Code of Hippocrates, like the Decalog of Moses, has stood up under the test of times, good, bad and indifferent, and it has been a saving grace to its adherents. Teaching and training mean so much. When the smoke of social and economic battle has cleared away, the true physician, having withstood the vicissitudes, will be found working under the same hippocratic banner, administering to all, be they rich or poor, with fidelity and alert watchfulness. It has been and it still is a most respectable code.

A. E. H.

Proceedings of Minnesota Academy of Medicine

Meeting of December 13, 1933

The regular monthly meeting of the Minnesota Academy of Medicine was held on Wednesday evening, December 13th, 1933, at the Town and Country Club. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the President, Dr. C. D. Freeman.

There were 57 members and three visitors present.

Minutes of the November meeting were read and approved.

Dr. John Butler, of Minneapolis, was elected to active membership in the Academy.

The following officers were elected for the year 1934:

President—Dr. Archa Wilcox, Minneapolis.

Vice-president—Dr. Alexander Hall, St. Paul.

Secretary-treasurer—Dr. R. T. LaVake, Minneapolis.

The scientific program followed.

Practical Experiments in What Actually Constitutes a Good Clinical Record

Dr. Halbert L. Dunn, Director of University Hospitals, read his Inaugural Thesis on this subject.

Abstract

I. The goodness of facts in medical records should be considered as a variable factor. Certain facts can be gathered with comparative accuracy by clerks; others are variable from one time to another even when gathered by the clinician upon the same patient. The accuracy of any recorded fact in the history and the physical examination may vary not only with the existence or lack of adequate definition, but also with respect to who asks the fact, how it is asked, the kind of patient who is the subject, and the mental or physical condition of the patient at the time of questioning.

II. It is essential to appreciate the difference between what we might define as a clinical record and a medical data sheet. The clinical record is the ordinary record of the physician, in which he takes the routine history and physical examination. The medical data sheet is defined as an adaptation of the principles used in gathering data for tabulation applied to the needs of the physician. The essential differences between clinical record sheet and medical data sheet are identified as follows:

NEEDS TO BE FILLED BY RECORD	CLINICAL RECORD	MEDICAL DATA SHEET
1. Continuity.	Rough order—Elimination of non-essentials.	Exact order and fixation of facts.
2. Order and sequence.	Rough order—Arrangement of sheets.	Exact order and fixation of facts—arrangement sheets.
3. Conservation in notation.	Conserve doctor's time—shift to clerical and eliminate non-essential.	Desirable—not at sacrifice of completeness. Conservation a matter of cost.
4. Condensation of record.	Desirable.	Desirable.
5. Ready yield of information.	Desirable for essential information only.	Essential for all facts major and minor.
6. Accuracy.	Desirable.	Desirable.
7. Legibility.	Essential.	Essential.
8. Expansibility and adaptability.	Essential.	Desirable—Difficult to achieve.
9. Completeness of notation.	Summary note of important facts is sufficient.	Essential for every item to be tabulated.

III. After the problems of gathering the data have been met, it is essential to arrange for the tabulation and cross-indexing of certain facts. This function is usually considered to be the task of the record librarian. At the present time an experiment is being undertaken with regard to evaluating the possibilities of establishing a central statistical service unit which will permit the use of modern tabulating machinery for this very difficult hospital medical tabulating problem.

The ultimate goal of the program would be fourfold: (1) to promote a better cross-indexing of records for all participating hospitals at little, if any, additional costs over their present record expenditures; (2) to make possible economical tabulation for research, administrative, or professional purposes; (3) to create generalized inter-hospital statistics with respect to administrative, cost, purchasing and morbidity statistics; (4) to perpetuate a centralized group which would carry on the work of standardization between hospitals.

Discussion

Dr. J. S. Gilfillan (St. Paul): I wonder if the members appreciate how important this subject is. I was glad to hear Dr. Dunn's differentiation between the clinical history and the data sheets. Most of us are not particularly interested in the data sheet, and most of our clinical histories are adapted to our immediate need. In regard to the different histories men take, a half a dozen men might take a history for the same disease and each one be a good history for the

man who took it. For instance, if Dr. Schwyzer and I were each to take a history of a gall-bladder case, I imagine they would be quite different and yet each one be good for the man who took it. My histories would be of no value to Dr. Dunn but they are pretty good for me—at least they are the best I can do for myself.

There is a great difference in this that we must appreciate, i. e., the value of the clinical history to the doctor who is taking it and also for the general records. The clinical histories might not be worth much for general records. It will be difficult to standardize these records. Perhaps it might be done for only certain diseases at first, so that they may be valuable to the whole profession, or to the clinical men outside the hospital. Of course in the hospitals the histories might be made differently, and I think that on the whole we pay too little attention to our histories in the hospitals. The intern takes the history and usually makes the diagnosis and sometimes it is not the diagnosis we would make, but we let it go rather than say anything about it. In many such cases we adapt ourselves to the hospital record, and we don't care particularly.

There would be a great deal of value in standardizing hospital statistics. As Dr. Dunn says, it might be done in epilepsy, asking the patients not only what they have but what they haven't. If a doctor asks the patient only about what he thinks the patient ought to have if he has epilepsy, then the record would not be particularly valuable to Dr. Dunn.

* * *

A New Flashlight Pointer, operated with batteries, was demonstrated by Dr. Horace Newhart, Minneapolis, and he asked Dr. Nordland to use it in connection with the lantern slides shown in his paper.

* * *

The Diagnosis and Treatment of Malignant Tumors of the Thyroid Gland

A paper with the above title, by Dr. Martin Nordland and Dr. Lawrence M. Larson, of Minneapolis, was presented by Dr. Nordland. This was illustrated with lantern slides.

Abstract

Malignant tumors of the thyroid are not extremely rare, when one considers numerous statistical studies showing that from 1 to 3 per cent of all nodular growths in this gland are carcinomata. However, it is only rarely that this type of malignancy is diagnosed pre-operatively since a small single area in a benign nodule is involved early in the disease, but, on the contrary, when there is a hard fixed tumor, hoarseness, dyspnea, and immovable vocal cords, the nature of the condition is obvious. By this time metastases are likely to be extensive; in fact, they often occur so early in the disease that their origin may be obscure. It also has been shown that the outlook is not entirely hopeless when once the diagnosis of malignancy of the thyroid gland has been made. By the combination of surgery and radiation in the treatment of these lesions, five-year cures have been obtained in as many as 43 per cent of cases. (Pemberton.)

Carcinoma

Of thyroid neoplasms Pemberton found malignant adenomata to comprise 39 per cent, papillary adenocarcinomata 31 per cent, and the remaining 30 per cent to be largely made up of diffuse growths of the scirrhous type including a few of the spindle cell variety. The microscopic diagnosis of malignancy in the thyroid is not always easy even for a trained pathologist, since there is a great diversity of histologic features as well as a marked similarity to benign conditions. However, actual invasion by the neoplastic cells of blood vessels, if found, is a reliable criterion upon which to base a diagnosis of malignancy. If such invasion is not present, reliance must be placed on histologic changes in cellular structure.

It is not surprising to note that metastasis takes place early in this disease when one considers the rich blood supply to the gland, and its proximity to the lymphatics and large blood vessels. The incidence and extent of metastasis, however, varies greatly with the type of lesion and the degree of malignancy, it being noteworthy that the papillary type of growth frequently shows late metastasis and then only to the regional nodes. Highly malignant lesions, such as the spindle cell variety, are of rapid growth, produce early distant metastasis and usually prove to be speedily fatal. Therefore in the treatment of this condition, both the factors of extent of the growth and the histologic structure of the lesion must be kept in mind.

The symptoms of this disease are not always characteristic. These patients are usually in the fifth and sixth decades of life and in 90 per cent of cases there is a history of a pre-existing nodule or unilateral enlargement of the thyroid gland. A nodule such as this may suddenly enlarge, it usually becomes harder, more nodular and soon symptoms of tracheal compression or laryngeal involvement are present. Mediastinal or pulmonary extension may produce dyspnea but pain is frequently a late phenomenon. Pressure on the recurrent laryngeal nerve or direct

extension of the growth into the trachea results in hoarseness and cough, and if the esophagus is encroached upon, dysphagia is present. Hoarseness is a significant symptom, since it usually means that the tumor has broken through the capsule and that the nerve is actually invaded and pressed upon. In non-malignant neck tumors, involvement of the recurrent laryngeal nerve is very rare. The question of the possibility of carcinomatous lesions of the thyroid to produce hyperthyroidism has not been completely settled although Pemberton states that this condition practically never takes place. When there is enlargement of the gland along with a condition of hyperthyroidism, the presense of malignancy is very rare, although in Pemberton's series, 87 per cent of the cases of malignancy were associated with benign nodules elsewhere in the gland. It is these benign adenomata which are most likely the cause of the hyperthyroidism.

In many instances operations are undertaken for a supposedly benign adenomatous goiter only to find, by immediate microscopic examination or by recurrence of the lesion at a later date, that neoplastic change had already taken place. Needless to say, it is in these cases that are not diagnosed clinically that the best results may be expected. This fact, however, is dependent upon the pathologist making a thorough search and reporting the presence of malignancy at the time of operation. Extension of the growth through the thyroid capsule, as evidenced by fixation of the gland, lymph node involvement or metastasis, usually precludes the possibility of cure or resection of the mass. When metastasis occurs, the incidence is in the following order: chest, bones (pelvis, clavicle, sternum, ribs, skull, knee, spine), and abdomen.

In the prophylactic removal of adenomata of the thyroid gland lies the greatest hope of cure of malignant lesions, since about 90 per cent of all these neoplasms occur in pre-existing nodules. After malignancy has been diagnosed, the treatment of choice is radical resection, and, if this is impossible, irradiation alone or combined with surgical removal is strongly indicated.

In early cases in which the carcinoma is confined within the capsule, removal of all of the growth without rupture of the capsule is sufficient. If there is no definite encapsulation, total removal of the affected lobe must be done. In still later cases, even though the growth is fixed, complete extirpation with subsequent irradiation should be done. At exploration, if the growth is found to be inoperable, radium needles may be buried in the tumor. These are attached to silk threads so that the surgical wound may be closed and the needles removed aseptically after the specified time has elapsed. In addition, a large rubber drainage tube should be left in the wound so that radium on a lead stem may be inserted into the depths during convalescence. In inoperable cases supplementary treatment is usually necessary, consisting of checkerboarding the region of the thyroid gland and applying radium in a mild erythema dose. High voltage roentgen ray treatment may also be used as a supplementary measure. By this method of treatment Pemberton and Fricke have effected a goodly percentage of cures.

In summary, it may be stated that surgery alone in this condition is usually not justifiable even if the malignant lesion is entirely removed, although in many instances radical resection has proved to be a satisfactory procedure. The latter is especially true of the papillary adenocarcinomata, which grow slowly and tend to remain encapsulated for a long time. In the more malignant types, radiotherapy certainly offers additional protection against the extension of the disease. Tracheotomy is frequently necessary, especially in the late stages of the disease, as a palliative measure.

The prognosis of carcinoma of the thyroid has been shown by Pemberton and Fricke and others to be as good as that of similar lesions of any other organ with the exception of the lip and the skin. Of 323 cases treated by them with a combination of surgery and irradiation, five-year cures were effected in 43.9 per cent. Twenty per cent of these individuals lived 10 years.

Sarcoma

Almost every conceivable type of sarcoma of the thyroid has been described, including the fibro-, chrondro-, osteo-, lympho-, hemangiosarcomata, and also the round, spindle and mixed cell variety. Metastatic sarcoma involving the thyroid gland has occurred but it is very rare.

Grossly, thyroid sarcomata are usually unilateral or median tumors; rarely do they produce a diffuse involvement of the gland. The rapidity of growth of these lesions is extremely variable depending upon their degree of malignancy. The more differentiated types, such as the fibrosarcomata, are of slow growth, while the more embryonic types, especially the round cell variety, enlarge rapidly, metastasize early and widely, and death commonly takes place relatively soon after the onset of symptoms. Hemorrhages and necrosis are common in the latter type of case, and in some cases of this nature enlargement has

been so rapid that the condition has simulated a phlegmon of the neck.

As the malignant tumor grows it invades adjacent tissues, the veins of the neck, the trachea, larynx, muscles, arteries, nerves and skin. The original contour of the gland soon becomes completely destroyed from extension of the growth. Symptoms of compression of the esophagus, of the trachea, and especially of the recurrent laryngeal nerve, early giving rise to hoarseness, are common. Death commonly occurs from respiratory difficulty due to edema and compression of the glottis.

Metastasis may be late, but usually it is early. The route by which it occurs is primarily through the blood stream, less frequently by way of the lymphatics; invasion of the thyroid veins within the goiter itself has been described along with the release of emboli directly into these veins, metastatic growths reaching primarily the lungs, and secondarily the skeletal system, liver, kidneys, and intestines. Frequently it is the case that metastasis dominates the picture while the primary focus remains relatively latent. Pulmonary metastasis often leads to erosion and perforation of blood vessels resulting in hemorrhages, pleural effusions, and so forth. These conditions may be confused with tuberculosis.

Sarcoma of the thyroid may occur in young individuals the same as it does in other locations of the body. According to most investigators sarcoma, and likewise, carcinoma, arises in about 90 per cent of cases in a pre-existing nodular goiter, usually in an individual in the fifth and sixth decades. As long as the growth remains inside the capsule, no symptoms are produced, so the exact time at which the malignancy begins cannot be determined. Pre-malignant conditions likewise are difficult in evaluation since they may exist for a long period and the exact time of their metamorphosis into malignant lesions cannot be determined. The goitrous enlargement is the only symptom of which the patient is aware.

Differential Diagnosis

In the differential diagnosis there are several conditions to be considered. The most noteworthy, although rare, is the so-called Riedel's struma, or woody thyroiditis. The etiology of this disease has been variously ascribed to tuberculosis, lues, and other types of chronic inflammation, but no convincing evidence of any of these factors has been presented. In this disease the gland is so hard that its consistence has been described as stony or like that of iron. However, its contour is smooth and rounded, the normal shape of the gland is retained, there is no hoarseness and there is little or no fixation of the gland to surrounding structures. There is no evidence of extension to regional nodes and distant organs. Malignant tumors are usually nodular and unilateral, they frequently metastasize early and soon involve the recurrent laryngeal nerves so that hoarseness and dyspnea are relatively common symptoms. The indications for surgical removal of the gland affected by woody thyroiditis consist mainly in pressure symptoms such as dyspnea and dysphagia. When surgery is undertaken for this disease, it should if possible be limited to partial resection of the gland, since as a rule very little functioning gland tissue is left and myxedema may result. Late in the disease myxedema is common but this may be controlled satisfactorily by the oral administration of thyroid gland extract.

Tuberculosis of the thyroid, while extremely rare and of little clinical importance, is occasionally confused with malignancy. It has been noted that tuberculosis occurs frequently in association with increased functional activity of the gland in distinction to malignancy which rarely invades a gland already involved with hyperthyroidism. The disease is most frequently a part of a generalized tuberculosis or secondary to an acid fast infection elsewhere in the body; the result may either be a frank abscess formation or a chronically inflamed fibrotic mass. Microscopically the latter type shows tubercles intra- or inter-folliculary. The surgical treatment is incision of the abscess or lobectomy, depending upon the condition encountered. The prognosis is excellent, according to Rankin and Graham. From their studies, they could not conclusively determine whether the hypertrophic gland is rendered more susceptible to invasion by the bacillus of tuberculosis, or whether the infection stimulates the parenchyma to abnormal activity resulting in hyperthyroidism.

In the author's series of a total of eleven cases of malignancy of the thyroid (10 carcinomata, one sarcoma), there have been four apparently cured individuals who have lived respectively 20 months, three years, four and one-half years, and eight years. One of these patients has almost a complete myxedema which necessitates daily doses of thyroid extract, but the other three individuals are normal in this respect. Deaths in the other seven cases took place up to the 19 months post-operatively except that of the individual with sarcoma, who has extensive metastases four months after thyroidectomy.

Discussion

Dr. Arnold Schwyzer (St. Paul): I want to congratulate the doctor on the number of interesting cases he had and on the fine sections he showed us tonight. In the treatment of carcinoma of the thyroid we should not rely on surgery alone, as carcinoma of the thyroid is mostly very radio-sensitive. I recall a case which was an extreme one. The patient had a goiter that came down 7 cm. below the clavicle on the outer surface of the chest wall. The elderly lady was in great misery and apparently it was a hopeless case. Nevertheless, we thought she would be better off if we operated, and we removed most of the mass and then inserted radium into the remaining part of the gland. She lived about two years, and for quite a while her neck looked surprisingly good. I follow this course in every case. They usually respond well. I think it is a good thing to apply X-ray treatment also.

The doctor mentioned the penetration of the blood vessels by the growth. I have seen that several times microscopically at the operation. Microscopically it can be seen not infrequently. At times you may have only a suspicion before operation. The diagnosis usually comes to you if a goiter has existed for many years and then the patient has a little pain, with a rapid increase of the goiter, often an increase in the consistency. Later on the mobility is reduced, etc.

There is one condition of the thyroid that is easily mixed up with these cases, and that is a subacute thyroiditis, or rather strumitis. The patient may have some fever. I remember Kocher once wrote: How long will it take until our Swiss physicians will remember that point, that a slight fever with recent swelling in the thyroid does not always mean thyroiditis, but may mean carcinoma?

The fact that these growths often select to metastasize in the skull or manubrium sterni or ribs is well known. I remember a case my brother once had where the man came in with a large tumor mass on his head and an enlarged left lobe of the thyroid. He at once took the enormous skull tumor to be a metastasis of the thyroid, and so it was. Some of these metastases are of the appearance of colloid containing thyroid tissue, apparently normal gland tissue, and in the thyroid itself you can detect perhaps only some harmless looking adenoma.

I remember one case of von Eiselsberg, where he removed the whole thyroid. At that time we did not know anything about parathyroids. Myxedema followed, which cleared up when a tumor developed later in the manubrium sterni. When this had to be removed on account of dyspnea, the trouble reappeared. Thus these metastases can at times have some physiological function.

The doctor spoke of Riedel's struma. About three weeks ago we had a case in which the thyroid was exceedingly hard and fixed to the side of the trachea. There was nothing malignant in it. In some portions the glandular tissue seemed choked off entirely by fibrous material.

As I remember now, I have seen only one case of tuberculosis. They are very rare. That was in a woman patient whom I saw again this year for another condition. I operated upon her about eight or nine years ago. She also had some toxic symptoms with it. Our sections gave, however, not nearly as pretty a picture as those I have seen tonight. Tuberculosis of the thyroid is not always giving such an unmistakable picture under the microscope, and it may require several sections to come to a positive opinion.

Dr. H. A. H. Bouman (Minneapolis): I was much impressed with Dr. Nordland's paper. It was because Dr. Arnold Schwyzer stimulated and aided me that I came to make the survey I did some years ago.

The metastatic colloid goiter cannot be distinguished from the ordinary goiter. I was in consultation in one case in which the doctor had operated behind the mastoid and he called it an aberrant goiter. Another patient I saw during August, 1926, in consultation, was a woman 63 or 64 years old who was sitting in bed at the hospital fighting for breath, yet serenely undisturbed. She had big lips, thick skin, and was myxedematous. She had come in that day because her difficulty of breathing had come on more or less suddenly. I asked her doctor to aspirate the tumor protruding from her neck and soon after that she was relieved. He operated during the following September and removed a long sack from down below the sternum, which contained about three-fourths of a pint of blood clot. There was no more thyroid found. In sequence, the doctor gave this patient thyroid until about March, 1927, at which time he had to stop the extract as the woman had grown exceedingly nervous. I saw her again with him at the hospital in September, 1928, because of a return of the difficult breathing. She then presented a case of hyperthyroidism with an enormous broad neck which was coarsely nodular as seen from the front. Breathing was labored. Biopsy showed carcinoma. She died in December, 1928. This was degenerated goiter, myxedema, adenocarcinoma causing hyperthyroidism.

Kocher used to say that there were two signs to be especially considered as early signs: (1) an unaccounted for, more or less rapid, growth, in a previously quiescent goiter; (2) a change in the consistency of the struma—growing harder. At that time people did not believe there were so many malignancies. He had 400 in about 4,500 cases.

The classification of Kocher and Langhans was as follows: Struma proliferans; Ordinary carcinoma; Metastatic colloid goiter; Parastruma; Post-branchial goiter of Getzowa; Papilloma and Cancroid.

The proliferating goiter was much like Halsted's hyperplasia—an increased blood supply and vessels, change and growth of the epithelium, reciprocal alteration in size and contour of the follicles, and vanishing colloid; only the malignant nodule had a stellate scar in the center. I thank you.

Dr. Gustav Schwyzer (Minneapolis): I would like to ask Dr. Nordland whether anything new in the line of treating metastases of cancerous goiter has come out at the last goiter conference which he attended. I recall from Kocher's Clinic that the Russians, after excision of the primary thyroid carcinoma, advocated that large doses of arsenic be given internally in order to check the metastases.

I remember one case in a middle-aged woman with a movable one-sided goiter the size of a goose egg, a goiter that did not pain her at all. She claimed she did not know of any increase in the size of the goiter during the last year before she came to us. At the same time she had a very soft manubrium sterni which could be pressed in without any pain and which rebounded into its place. Kocher at that time made a diagnosis of cancer in the goiter and removed the same. The goiter specimen showed in its middle a sarcomatous growth the size of a hazelnut.

The case my brother mentioned that I had years ago was in a man who showed a tremendously enlarged skull. Palpation of the bone caused a crackling sensation as if the top of the skull were composed of bone platelets. Dr. Clarke Stewart at the time asked me for my permission to show the case to his class at the University and I remember he presented the case as an osteosarcoma of the skull. I did not agree with his diagnosis and excised a small, one-sided goiter the size of a hen's egg. The patient never knew he had a goiter and therefore was unable to make any statement as to growth of the goiter. The cancerous degeneration was very evident under the microscope.

Dr. Nordland (in closing): I want to thank the gentlemen for their discussions. While showing the slides, I neglected to discuss the treatment which is brought out in my paper and which agrees with Dr. Arnold Schwyzer's discussion. Radium plus resection of the lesion is the most effective weapon we have in the treatment of carcinoma of the thyroid. I think the combination of surgical removal and radium should be used. The suspected carcinoma of the thyroid should at least be explored just the same as carcinoma elsewhere and if the condition is found to be too serious a problem for surgical removal, radium can be applied within the wound or the wound may be closed and radium applied on the surface.

The treatmment of the metastases referred to in Dr. Gustav Schwyzer's question is not settled. I am not familiar with any treatment with drugs and do not know of any better remedy than deep X-ray or radium therapy. In the treatment of malignancy of the thyroid, the best results will be obtained by early diagnosis and early radical resection. Adequate surgery alone will cure many adenocarcinomata of the papillary type which have not penetrated the capsule. Wide resection plus radium offers the best results in the majority of cases, while radium alone will often give surprisingly good results in those cases considered too extensive for surgical interference. Palliative tracheotomy will occasionally be necessary in some of the far advanced cases.

* * *

The meeting adjourned.

R. T. LaVake, M.D.
Secretary.

NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. and Mrs. Henry W. Cook, Minneapolis, are spending a few weeks in touring Mexico.

Dr. Ernest Lodmell, formerly of Bowbells, N. D., is now on the staff of the General Hospital, Minneapolis.

Dr. Henry E. Armstrong, one of the pioneer and prominent surgeons of Billings, Montana, died last month after a short illness.

Dr. Benjamin Lokke has opened offices for

general practice at Vermillion, S. D. The doctor was formerly located at Egan.

Dr. George A. Sarchet, Mobridge, S. D., will spend several months in a vacation trip abroad, visiting all the leading Europeon cities.

Dr. J. E. Scanlon, formerly in practice at Edgeley, N. D., has moved to Farmington, Minn., where he continues general practice.

Dr. F. C. Nilsson, heads the staff of the Sioux Valley Hospital, Sioux Falls, for the coming year, with Dr. Anton Hyden, as secretary.

Dr. Paul E. Kenyon, who has been in active practice at Wadena, Minn., for over 36 years, has decided to retire and take a long needed rest.

Dr. Corrin Hodgson, a recent graduate of a Philadelphia Medical School, has just opened offices for general practice at Fergus Falls, Minn.

Dr. F. T. Benoit was elected president of the Winona County Medical Society; Dr. L. L. Younger, vice-president, and Dr. I. W. Steiner, secretary.

A new hospital is to be constructed at Fort Thompson, S. D., at a cost of about $100,000. It will take the place of the one destroyed by fire last year.

Dr. B. F. Simon, city health officer of St. Paul, died recently from an attack of cerebral hemorrhage. Dr. Simon was a graduate of the Rush Medical College.

Dr. Robert B. Bray, Fargo, was recently married to Miss Eleanor Burnett of that city. Dr. Bray is a graduate of the University of Minnesota Medical School.

Dr. O. N. Hoyt, formerly a well known physician of Pierre, S. D., died at Long Beach, Calf., following an attack of Pneumonia. Dr. Hoyt was 90 years of age.

Dr. Carl A. Hass, St. Paul, who retired from active practice some few years since, died last month at the age of 60 years. Dr. Hass was a graduate of the University of Minnesota.

The January meeting of the Northwest District Medical Society was held at Minot, with a large attendance of members. Dr. Frank Heck, of the Mayo Clinic, Rochester, was the guest speaker.

Dr. John J. McLaughlin, well known and honored physician of Faribault county, Minn., for many years, passed away Tuesday morning, January 16th, at his home in that city after a short illness.

The Sioux Valley Eye and Ear Accademy held their annual meeting at Sioux City, last month, with a large attendance and a fine program being presented. Dr. C. L. Chambers, Des Moines, is president of the society.

Dr. W. A. Fansler, Minneapolis, was a guest speaker at a medical meeting at Cedar Rapids, Iowa, on January 12th. His subject being, "The Physician's Responsibility in Rectal Carcinoma."

The new officers of the Rosebud, South Dakota Medical Society for the year are: Dr. F. D. Wilson, Winner, president; Dr. A. O. Carmack, Colome, vice-president, and Dr. R. V. Overton, Winner, scretary.

At the annual meeting of the District Medical Society held at Aberdeen last month, Dr. E. A. Pittenger, Aberdeen, was elected president; Dr. Robert Hill, Ipswich, vice-president, and Dr. J. L. Calene, Aberdeen, secretary.

After 25 years as physician on various Indian reservations, Dr. A. H. Spears of Sisseton, S. D., has been retired from active service. He has been at the Sisseton-Wahpeton reservation since 1920. Dr. Spears had reached the retirement age of 65 years.

Dr. Henry E. Armstrong, Billings, dean of the eastern Montana medical men and one of the leading diagnosticians of that state, died last month from a sudden heart attack. The doctor was 66 years of age, and a graduate of the University of Toronto, Canada.

Five men and one woman were granted licenses to practice medicine in North Dakota by the state board of medical examiners, as follows: Donald L. Peterson, Fargo; Milton Greengard, Rolla; Olafud W. Johnson, Rugby; Bertha B. Brainerd, Jamestown; Albert H. Reiswig, Fairmonth, and Newton W. Fawcett, Starkweather.

The Minnesota Pathological Society of the University of Minnesota Medical School, Institute of Anatomy, presented the following program last month. "Adrenal Cortical Hormone Experimental and Chemical Studies," Dr. E. C. Kendall; "Clinical Applications," Dr. A. M. Snell and "Basophilic Adenoma of the Hypophysis" by Dr. H. L. Ulrich.

One Minneapolis and one Rochester physician are among 33 United States doctors chosen by deans of medical schools and editors of medical journals as having done most to advance science during 1933. Dr. Benjamin W. Clawson, Minneapolis, is cited for "Investigation of Arthritides," and Dr. Frank C. Mann of Rochester, for "Research in Surgery."

Dr. Charles N. Spratt, Minneapolis, was invited to demonstrate motion pictures of his cataract and glaucoma operations at Los Angeles. Dr. Spratt also showed his motion pictures at Aberdeen, S. D., on January 9th, and at the Des Moines Academy of Ophthalmology on January 15th. He will also be on the program at meetings of Ophthalmological Societies at Long Beach and San Diego.

Accepting a proposal advanced by the North Dakota Medical association, the board of Burleigh county commissioners, designated all registered physicians in the county as county physicians during the emergency period. Under this program, needy residents of the county may visit their family physicians for medical care, with the county to be charged by all doctors according to a uniform scale of reduced fees.

The oldest practicing doctor in the United States, W. A. Allen, 99-year-old physician of Rochester, Minn., has become exhausted by overwork and has been removed to a hospital for rest and quiet. Dr. Allen, who has gained wide-spread distinction as being the oldest living doctor in the country, has become quite weak, attributed to overwork. He has been receiving many vistors at his office during that time, but has not been making calls.

The Minneapolis Surgical Society held its twelfth Annual Anniversary Foundation Dinner on February 1st, at the Minneapolis Club, Minneapolis. The guest speaker was Dr. Lester R. Dragstedt, Professor of Surgery at the University of Chicago, his subject being "The Etiology of Gastric Ulcer." The Minneapolis Surgical Society, which was founded in 1922 and which has a limited membership of fifty, is celebrating its twelfth anniversary with a completed membership list.

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters). William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota is the speaker. The program for the month of February will be as follows: February 7, "Heart Fear"; February 14, "Measles"; February 21, "The Common Cold"; February 28, "Tumors of the Skin."

Doctor E. Starr Judd, Professor of Surgery in the Mayo Foundation, Rochester, has endowed an Annual Lectureship in Surgery at the University of Minnesota. The first Judd Lecture will be given by Dr. Dean Lewis, president of the American Medical Association and Professor of Surgery at the Johns Hopkins Medical School on Tuesday, Feb. 13, in the Anatomy Amphitheater at the University of Minnesota at 8:15 p. m. The subject of his lecture will be "The Hypophysis, the Master Gland: the Histology, the Physiology, and the Clinical Syndromes Associated with Its Lesions." Dr. Judd is a graduate of the Medical School of the University of Minnesota of 1903.

Following an investigation made by the Minnesota State Board of Medical Examiners, proceedings were instituted to have forfeited to the State of Minnesota, the charter of The Medical Service Company, a Minnesota corporation. The Medical Service Company, Minneapolis, was organized by Dr. Edwin C. Muir, a licensed physician, for the following purposes: "The purposes of this corporation are to own and operate a clinic or hospital where patients may receive medical or surgical treatment and to enter into contracts with individuals or co-partnerships to furnish them or any of them medical care or treatment; and to enter into contracts with other corporations for furnishing and providing medical or surgical care and treatment to their employees." Following the organization of this corporation, medical business was solicited in Minneapolis, and particularly among the school teachers, where complete medical services were offered for the sum of $1.50 per month. This service included examination, medical treatment, prescribed medicines and surgery. A stipulation has been entered into, whereby the corporation is to be completely dissolved according to law on or before February 20, 1934. There is to be no further solicitation of business of any kind whatsoever. Unless the corporation is dissolved on or before that date, judgment will be entered annulling the franchise of the corporation and forfeiting its charter to the State. The Minnesota State Board of Medical Examiners intends to enforce this provision of law and to have legal proceedings instituted to stop such unlawful practice of medicine.

The JOURNAL LANCET

Minneapolis, Minnesota
February 15, 1934

New Series
Vol. LIV, No. 4

Amebic Dysentery*

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AMEBIC dysentery has been known for more than fifty years. In 1890 Osler reported the first case occurring in North America. This has been considered a tropical disease by most of the doctors living in the North Temperate Zone. In the past only a small minority of the physicians have considered amebic dysentery in determining the etiology of an acute or chronic diarrhea. The present epidemic, however, will undoubtedly bring our profession to the realization that it may occur in any part of the world. This is further emphasized by the fact that one of our own colleagues contracted amebic dysentery while he was in Siberia, during the World War.

Sixteen cases, occurring in Minneapolis, have been reported to the Board of Health during the past year. Due to the fact that many physicians do not know that it is a reportable disease, a number of cases may not have been reported. Most of these cases give a history of having been in Chicago during the World Fair, at which time they probably contracted the infection. I believe there are a number of cases which have been overlooked, likewise, in the future, there will be some cases incorrectly diagnosed as having amebiasis.

In the past, most of the patients who have been diagnosed as having amebic dysentery have had the more chronic form, whereas, in the present epidemic, they have been acutely ill. The disease is usually characterized by severe abdominal cramps, diarrhea with blood and rectal tenesmus. Occasionally, however, cases are reported in which the patients complain of no diarrhea but only acute abdominal discomfort or the symptoms of abscesses of the brain or liver. The very nature of this disease is such that it will behoove the medical profession to be keenly aware of its bizarre manifestations.

The diagnosis is not always apparent and the enthusiasm stimulated by this epidemic may cause us to overlook appendicitis, carcinoma or any of the other ulcerative intestinal diseases. It is also possible that amebiasis may be superimposed upon some other chronic or acute ailment. In the Far East it is quite common to have a bacillary infection and amebiasis occur in the same individual. Such cases must be treated for both of these conditions. As bacillary dysentery is present in this country also, it would be well to remember this fact when making the laboratory examination in the more severe cases. Likewise, chronic ulcerative colitis and amebiasis or carcinoma and amebiasis may exist in the same individual. It is worthy of note that if an amebic infestation is present any abdominal operation is a hazardous procedure until the patient has been sufficiently treated.

The ameba is transmitted by contaminated food or water. Dr. Magath recently suggested that the present epidemic may have started through a contaminated water supply, possibly a faulty connec-

*Presented before the Hennepin County Medical Society, January 17, 1934.

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tion or backflow from sewer pipes into the drinking water supply. He felt that the solution previously advanced was difficult to understand because it seemed unlikely that so many people could be infected by eating only one meal or possibly one sandwich, prepared in the kitchen of a hotel where some of the help were suffering from the disease.

The diagnosis of amebic infestation cannot be made by history alone. It can be made only by finding the endameba histolytica either as a motile form or the cystic form in the stool or from scrapings obtained directly from the bases of the ulcers.

If amebiasis is suspected the stools should be carefully examined by a competent parasitologist. If the examination proves negative, a saline laxative should be given before breakfast and the patient instructed to go to the laboratory for a stool examination immediately after eating. Recently I saw a patient who had had three negative stools following the above procedure, on proctoscopic examination, however, the characteristic ulcers were found and in direct smears from the bases of these ulcers the same parasitologist was able to demonstrate two to three typical pathogenic amebae in each microscopic field. At the Mayo Clinic 70 to 98 per cent of the cases have shown amebae in one or more of the three daily stool examinations.

The proctoscopic findings in some cases are very typical and, to a well trained proctologist, cannot be easily mistaken by those occurring in any other disease. Some years ago Dr. P. W. Brown reported a series of active cases, in which about 33⅓ per cent could be diagnosed definitely, by proctoscopic examination. In the present epidemic almost all of the cases have had rectal ulcers but in some of them the ulcers are anything but characteristic. The ulcers are usually discrete and vary in size from 1 mm. to three or more centimeters in diameter. The mucosa between the ulcers is normal in apearance. The ulcers appear predominatly on the valves of Houston and the prominent folds of the intestine. They present a punched out, umbilicated appearance having undermined edges and they are usually covered with a grayish white exudate. Usually this exudate can be easily wiped off with a cotton swab—occasionally it may be found to be very tenacious and resemble the exudate found on tuberculous ulcers. In the latter, however, active tuberculosis can usually be demonstrated elsewhere in the body. The ulcers may be so large and may be confluent so that most of the distinguishing characteristics are lost. In chronic ulcerative colitis the ulcers are much smaller, being only pin point in size, and the whole surface of the mucosa is involved. In addition the lumen of the bowel is usually contracted and the valves of Houston disappear. This is not true, ordinarily, in amebic dysentery.

Recently I saw a case of acute amebic dysentery which could have been easily mistaken for a carcinoma of the rectum if a proctoscopic examination had not been made. Two stool examinations for ameba proved negative. Within reach of the index finger there was a mass which felt like a carcinoma. Upon proctoscopic examination it was found that the mucosa was thrown into a huge fold and upon it were numerous typical amebic ulcers. The distal 24 cm. of the bowel was examined and proved to be studded with similar ulcers for the full distance. Smears taken directly from the ulcers revealed the endameba histolytica in large numbers.

Amebiasis usually starts in the cecum. Other portions of the intestinal tract most often involved in order of their frequency are: the ascending colon, the rectum, the sigmoid, and the appendix. The amebae bury themselves in the mucosa and undermine it. The lesions, as a rule, involve only the mucosa, but in the severer cases the entire bowel may become gangrenous.

The roentgenologic examination of the colon cannot be relied upon to make the diagnosis of amebic dysentery. Frequently, however, according to Dr. Harry Weber, "typical manifestations of the disease are elicited; sometimes the findings are only suggestive; and in many instances of amebiasis no roentgenologically demonstrable evidence of anatomic change in the colon is found. This is due to the variation in the severity and extent of the pathological process set up by the amebic invasion. The mere presence of endameba histolytica in the stool means that an intestinal lesion exists, but this lesion might be so minute that it is difficult to see even at direct naked eye examination. Such a lesion will be well below the threshold of roentgenologic discovery. The more extensive and severe the antatomic changes due to the amebic infestation are, the more vividly and the more readily are they reflected in the roentgenologic examination. In practice it happens that when roentgenologic investigation of the colon is carried out on those in whose stools endameba histolytica is, or can be discovered, the findings are practically always definitely positive for some degree of ulcerative colitis or definitely negative. When negative, it simply means that anatomic change of any great extent has not taken place, and according to Craig, this happens in the ma-

jority of the carriers of this organism. The primary purpose of the roentgenologic examination is not to make the diagnosis of amebiasis but to deliver objective evidence of the extent and severity of the anatomic changes produced by this organism in the colon."

"The cecum and ascending colon are the sites of preference for the anatomic changes produced. The ileum is never involved. We have learned that the deformity produced in amebic ulcerative colitis is not precisely like that produced by other forms of colitis. The differential diagnosis is based not only on this circumstance but on its peculiar distribution in the bowel. The roentgenologic examination is not expected to show ulcers as such in any of the forms of ulcerative colitis that are commonly encountered. It does demonstrate mucosal destruction and anatomic changes resulting from submucosal infiltration; narrowing, shortening, stiffening, changes in mobility and motility, etc." Dr. Weber feels that the failure of the roentgenologic method to demonstrate distinctive findings is due only to the fact that so many of the carriers have lesions too minute to be roentgenologically demonstrable. These minute lesions may, however, be responsible for severe dysenteric symptoms; on the other hand, some of those who have extensive anatomic changes have little to suggest it clinically.

Agglutination tests have been used but have not proved practical.

The incubation period is thought to be from three to ninety-five days.

Carriers: Those who harbor the amebae and cysts, without having enough disability to warrant medical consultation, are a constant source of danger. In all probability, the exact percentage of the population who can be so classified will never be known. It has been variously estimated that this percentage ranges from 1 to 10 per cent of the entire population. Recently a number of writers have stated that 1 per cent would be a more accurate estimate. The carriers may have had the disease severely at some time and recovered, symptomatically; or the history of an acute attack may be entirely lacking. Occasionally the carriers may complain of abdominal cramps or short periods of mild diarrhea followed by constipation. In view of the large number of carriers it is reasonable to believe that many of the so-called relapses after careful and thorough treatment, may be due, to reinfection by some carrier. Hence, in the treatment of this disease it is very essential to examine the stools of all the members of the household, and even those of close associates. A careful examination, as stated before, should include, first, the administration of a saline laxative to the patient before he presents himself at the laboratory for a stool examination. Second, the examination of the stools should be made on three consecutive days by a competent parasitologist.

Complications: The complications of amebiasis are varied and sometimes very difficult to diagnose. The most common one is liver abscess. Pain in the hepatic region, fever and toxemia are the symptoms which occur most frequently in this condition. The leucocyte count increases noticeably. Peritonitis, pulmonary abscess, brain abscess, pericarditis, splenic abscess and abscess in the urogenital organs have been often reported. A study of reported cases would lead one to conclude that, at some time or other, all of the body structures have been the host to pathological processes initiated by the ameba. The question of proper treatment, especially that of liver or lung abscess, is much debated but the concensus of opinion now seems to be that the patient should first be treated with antiamebic drugs, and after this has been accomplished, aspirate or establish surgical drainage. If the liver is involved it is not advisable to use any of the arsenical preparations.

Treatment: The treatment of this disease occasionally brings about an almost miraculous cure. This is not always true, as sometimes a case proves very stubborn, and various methods must be resorted to before the stools become ameba free. A patient may be apparently cured only to have a relapse occur months later. There is evidently a missing link in our treatment of this disease. Dr. A. H. Logan offered some very useful suggestions in regard to this when he stated, some years ago, that the courses of treatment should be at the proper intervals and that the size of the dose of the antiamebic drug was more important than was the length of time over which it was given.

In estimating the interval between the courses of treatment, several pertinent facts should be considered. First, a sufficient time should be allowed for the excretion of most of the drug, and this is especially true in giving any arsenical, as some of this drug is stored in the intestinal tract, and may therefore have cumulative affects. Second, to allow the cysts to sporulate their small motile amebae. The cysts are very resistent to treatment and it is the cysts that usually remain to cause further trouble.

Many drugs have been used with varying degrees of success. In this discussion, however, I will deal only with those drugs with which I am familiar.

Emetine was first used in 1912 and at that time was hailed as a specific. This drug, like many

others which have enjoyed undue popularity, has now assumed a more rational place in the treatment of amebic dysentery. During the past few years it has been estimated that emetine will cure only 30 per cent of the cases in which it is used. Any drug to have a specific action on the ameba must be a protoplasmic poison. It, therefore, has an effect on the host also, and for this reason any drug given in the treatment of amebiasis must be very carefully supervised. Emetine has a definite effect on the heart muscle and may also produce neuritis. According to Young and Tudhope and quoted by Willner "neuritis (of the alcohol or arsenical type) is not produced by emetine; but degeneration of the motor fibres (as in lead palsy) may occur." It is, however, one of the most satisfactory drugs we have for producing prompt symptomatic relief. Arsenic is another valuable drug but its administration is not without risk. Aside from its acute poisonous effect and also the fact that some people are very susceptible to this drug, it has cumulative effects, and therefore should not be given over long periods of time. It is well to instruct a patient who is being treated with these drugs to discontinue the medication immediately if they note a skin eruption or feel as though they are "coming down with influenza."

In deciding upon the best arsenical to use it is necessary to consider its elimination time and the toxicity. Stovarsol (acetarsone) is an arsenical preparation which has been widely used. Its elimination time is irregular and it is considered a little more toxic than some of the other preparations now on the market. It is administered in tablet form containing 0.25 (4 grains), one tablet to be chewed with each meal for four days, making a total of twelve tablets. This can be termed "one course" of treatment and ten to fourteen days should elapse before repeating the drug, and a patient usually requires three to four such courses.

Treparsol is another arsenical preparation which has enjoyed an increasing popularity the past few years. Its elimination time is considered to be three days and it is also thought to be less toxic than stovarsol. It is administered in the same manner and dosage as stovarsol.

Carbarsone (Eli Lilly & Co.) has about the same arsenical content as each of the other two mentioned. Its toxicity is not as great but its elimination time is thought to be slower than treparsol. Treparsol, stovarsol and carbarsone are pentavalent arsenicals and therefore may have some effect on the optic nerve. In prescribing these drugs it is imperative that one not only watch for the other symptoms of arsenical poisoning but also for visionary disturbance. No cases of poisoning have as yet been reported when carbarsone is given according to instructions of Eli Lilly & Co. They recommend one pulvule of 0.25 gm. to be given twice daily after meals for ten days. If necessary repeat the course after an interval of ten days. Excellent results have been reported with this drug. It can also be administered in retention enemas.

Yatren, chiniofon or anyodin is an iodine and oxyquinoline compound and is used extensively in China. It is low in toxicity and is very suitable for administration to children.

Vioform (iodochlorhydroxyquinoline) recently has been used and according to reports of Leake and his associates, the administration of this drug has given some very encouraging results.

The treatment I pursue is essentially the one recommended by Dr. P. W. Brown. He came to the conclusion that a combination of emetine hydrochloride and some arsenical preparation gave the best results. In the usual case emetine hydrochloride (2/3 of a grain) is given subcutaneously twice a day for three days. Treparsol, 0.25 gm. tablet is chewed with each meal for four days. These drugs are started simultaneously. In the more severe cases the dosage of emetine is increased a little, i. e., as much as six or seven grains may be given during the three days. This course is repeated in 10-14 days and then following another 10-14 days interval another course of treparsol alone is given. Recently I have used a combination of carbarsone and emetine with very good results. It is thought that the amebae may become resistant to any of the antiamebic drugs, and in these resistant cases various other remedies are resorted to. If arsenical preparations have been used and proved ineffective some iodine preparation, such as yatren or vioform should be tried.

If a patient is critically ill and amebiasis is strongly suspected it has been suggested that antiamebic treatment be instituted at once, regardless of the fact that laboratory tests have not been entirely completed. Many times, after bismuth and some of the other drugs have been previously given it is difficult to find the amebae, and hence valuable time is lost. This emergency treatment is recommended only when a patient's condition is critical. In other cases I would advise complete laboratory investigation and a proctoscopic examination to insure a correct diagnosis before treatment is instituted.

In the more acute cases some form of opiates must be administered to relieve the abdominal

Age	Sex	Prob. Incubation Period	No. Stools for Pos. Diag.	Proct. Exam.	Symptoms	Duration of Symptoms Before Consulting Phy. & Diag. Being Made	X-ray Findings	Prob. Source of Infection	Dr.
47	M.	42 days.	1	No ulcers found.	Diarrhea—no gross blood sl. abdominal cramps.	10 days.	Negative.	Chicago.	H. B.
21	F.	7 days.	1	No exam.	Diarrhea with blood and abd. cramps. Diagnosed September 20, 1933.	25 days.	No X-ray.	Chicago.	E. A.
34	F.	60 days.	3	Ulcers present.	Diarrhea with blood and cramps.	3 days.	No X-ray.	Stayed at a hotel in Chicago.	S. W.
37	M.	60 days.	3	Ulcers present.	Diarrhea with blood.	3 days.	Hyper-irritable bowel.	Stayed at a hotel in Chicago.	C. S.
30	F.	?	1	Ulcers present.	Symptoms of severe, acute appendicitis with diarrhea and blood. Pelvic abscess drained in one week.	1 day.	No X-ray.	?	F. H.
50	M.	30 days.	1	No exam.	Malaise, diarrhea and pain in upper abdomen.	7 days.	No X-ray.	Stayed at a hotel in Chicago.	E. B.
55	F.	10 days.	Many before a positive.	No exam.	Herpes zoster for three weeks with considerable pain in abd. over cecum and app. region with constip., then diarrhea.	21 days.	No X-ray.	Stayed at a hotel in Chicago.	H. U.
30	F.	30 days?	1	No exam.	First had involuntary passage of mucus, then diarrhea with blood.	14 days.	No X-ray.	Stayed at a hotel in Chicago.	H. U.
35	F.	90 days.	1	Ulcers present.	Diarrhea with blood and mucus.	10 days.	No X-ray.	Chicago.	R. J.
27	F.	150 days.	1	No ulcer present.	Diarrhea with cramps. No blood.	10 days.	No X-ray.	Chicago.	H. N.
32	M.	?	1	No exam.	Pain in abd. and diarrhea with blood.	45 days.	No X-ray.	Stayed at a hotel in Chicago.	A. H.
52	F.	21 days.	1	No exam.	Pain over app. region, then pain in liver area and across abd., followed by diarrhea with blood.	30 days.	No X-ray.	Stayed at a hotel in Chicago.	F. G.
42	M.	50 days.	0	Ulcers present. Diag. made from scrappings.	Diarrhea with abd. pains at time of med. consult. Previously only blood per rectum with rectal tenesmus.	58 days.	No X-ray.	Stayed at a hotel in Chicago.	W. F.
40	M.	?	Many were negative.	Ulcers present.	Recurrent attacks diarrhea with blood.	16 years.	Incomplete rotation of cecum otherwise negative.	Texas, 1917, worse after visit to Chicago; stayed at various places.	A. M.
24	F.	50 days.	1	Ulcers present.	Diarrhea with blood for two weeks, recurred in one week.	30 days.	No X-ray.	Stayed at various places in Chicago.	J. D.
35	F.	60 days.	1	No exam.	Cramps in lower abd. at night with diarrhea of 4-5 stools in one hour. Free for 2-3 weeks with recurrence as above.	240 days.	Walls of descending col. str. and smooth, could not fill cec. with enema.	Stayed at various places in Chicago.	J. G.
47	M.	15 days.	3	Ulcers present.	Abdominal cramps with diarrhea for six weeks, then sl. diarrhea for time. Recurred in three weeks.	40 days.	Suggested spasm of cec. and desc. col.	Chicago.	C. M.
42	F.	?	4	No exam.	Diarrhea with pain in left side and over cecum and appendix.	45 days.	No X-ray.	Husband had it four years ago; not in Chicago this year.	L. H.
63	F.	6 days.	3	Ulcers present. Smears positive.	Diarrhea with blood.	25 days.	No X-ray.	Stayed at a hotel in Chicago.	R. Y.
35	F.	10 days.	1	Ulcers present.	Diarrhea with blood.	60 days.	No X-ray.	Stayed at a hotel in Chicago.	R. Y.
29	F.	4 or 60 days?	3	No ulcers.	Diarrhea came on while in Chicago in August, only for few days, recurred in October.	?	No X-ray.	Stayed at a hotel in Chicago.	R. Y.
55	M.	20-30 days.	4	No exam.	Uncomfortable feeling in abd. and occ. sl. diarrhea, frequent passage of gas and mucus.	120 days.	Ulcers in desc. col. and sigmoid.	In Chicago; ate at various places.	H. F.
54	M.	?	1	Ulcers present.	Diarrhea for six months rectal tenesmus, loss of weight. Diag. in June.	180 days.	No X-ray.	Partner had it some years ago; also visitor at home with chr. diarr.	T. P.
42	M.	21 days.	10-15	No ulcers.	Pain in rt. upper quadrant and temp. constipated at first, later developed only occ. a loose stool but no diarrhea, no blood.	21 days.	X-ray negative.	Stayed at a hotel in Chicago.	C. W.
39	F.	20-30 days.	4 negative.	Ulcers with inflamed mass in rectum; smears positive.	Diffuse pains throughout abd. for few days before diarrhea started; 10-20 stools a day. Later marked pains in rt. upper and lower quadrant. In bed for over a month. Blood in stools last two weeks.	60 days.	No X-ray.	Stayed in Chicago at various hotels for six weeks.	W. S.

pain. They also are of value in quieting the intestinal activity which is very important where there is deep ulceration and where there is an imminent danger of perforation.

The diet in the acute cases should be restricted to a liquid non-irritating and low residue diet. In the severer cases food should be withheld entirely and intravenous glucose given for a short time. In the ambulatory case no change in diet is necessary, except, possibly, omitting the very coarse and irritating foods. It is not necessary to confine this type of patient to bed while undergoing treatment.

The patient acutely ill should be isolated and cared for as you would care for a patient who had typhoid fever. During the fly season the room should be screened because flies can carry the cysts or pass them unchanged through their intestinal tract and deposit them on food.

The question "Is my patient cured?" always arises at the conclusion of any treatment. In some diseases such a question is easily answered but in the treatment of amebiasis the answer is more obscure. We are always confronted with reports of recurrences which occur years after apparent cures. Why should the amebae suddenly come to life after lying apparently dormant for years? This is difficult to explain. But we do know that this has been reported time and again. I am inclined to believe that many such cases were not sufficiently treated or else they were reinfected from some other source.

At the conclusion of the treatment the stools should again be examined on three successive days. The stool examination, however, should not be repeated until at least two courses of treatment have been given. If the stools still reveal the presence of the ameba a third course should be given as previously outlined. It is advisable to repeat the stool examinations at the end of one month and three months. If these examinations are all negative then we may pronounce this patient cured with but slight risk of recurrence.

The table on page 81 represents a brief outline of the cases of amebic dysentery collected by me, which have occurred in Minneapolis during the past six months.

Summary of Cases in Minneapolis

Twenty-two of these twenty-five patients gave a history of having been in Chicago. Thirteen stayed at various hotels in Chicago. The remainder visited at the homes of friends or at clubs. All had eaten at various places in Chicago.

Ten of these patients were men ranging in age from 32-55 years, and the estimated incubation period was 7-50 days.

Fifteen of these patients were females ranging in age from 21-63 years. The estimated incubation was 3-90 days.

One patient noticed no symptoms until five months after her visit to Chicago.

All consulted physicians because of having had diarrhea although many gave a history of having had abdominal pains and discomfort for variable periods of time before diarrhea developed. All, except five, had noticeable blood in their stools. Proctoscopic examination failed to reveal any ulcers in these patients, but ulcers were present in those who had noticeable blood in their stools.

One patient, whose symptoms and physical findings so strongly suggested appendicitis, was rushed to the hospital as an operation seemed imperative. However, her stools were examined because she also complained of diarrhea, upon examination of the stools the endamebae histolytica were discovered and operation was therefore postponed and suitable medication instituted. One week later a pelvic abscess was drained.

Another patient had a mass in the lower rectum which could have easily been mistaken for a carcinoma upon digital examination. However, upon proctoscopic examination, as previously stated, the mass was found to be due to amebic infestation.

Seven of these patients were studied roentgenologically, three of the studies revealed demonstrable bowel changes, such as hyperirritable bowel, ulcerative lesions in descending colon and sigmoid and spasticity of cecum and ascending colon.

Endameba histolytica were found in thirteen on first stool examination.

In one, on second examination—in five, on third—in two, on fourth, and in two, only after many stool examinations.

Fifteen were examined proctoscopically and ulcers were found in all but two. Three were diagnosed only after smears had been taken from the bases of the ulcers. Two had had negative stool examinations prior to the proctoscopic examination and the third of these was seen before stool examination had been attempted.

Tuberculosis of the Conjunctiva

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BECAUSE of the rarity of this condition expecially in elderly people* (Erye found tuberculosis of the conjunctiva in only eight out of 25,000 new eye cases in London), and because of its prompt response to a simple method of treatment, I feel that the following case of tuberculosis of the conjunctiva is worthy of presentation.

Dimmer[1] classifies tuberculosis of the conjunctiva as: (1) ulcers with ragged edges, (2) tracoma-like granulations, (3) lupus of the conjunctiva, (4) cockscomb-like proliferations of the fornices, (5) tumor-like pedunculated structures. Sattler mentions four groups, one of which is not clearly expressed in Dimmer's classification—"hypertrophied papillae and rounded outgrowths of granulation tissue springing from the palpebral conjunctiva or situated in the fornices." This latter group more nearly approaches the description of the case here presented.

Mrs. E. M., age 68, came to the office April 8, 1933. Present complaint was moderate itching and smarting of the eyes with a little tearing and crust formation at night. Condition commenced in the left eye ten months previous. Right eye commenced to bother two months previous. Past history and family history negative. Examination showed conjunctivitis resembling a tracoma-like granular folliculitis and, on the left eye, a granulating tumor about the size of a small pea on the lower palpebra near the external canthus. Examination of the nose and throat was negative.

I made a tentative diagnosis of tumor of the lower tarsus and an accompanying tracomatous conjunctivitis (Tracoma is not uncommon in this region).

Since I thought it quite possible that the tumor might be a sarcoma, I removed it rather radically with a V-shaped piece of skin and tarsal cartilage. The tarsus and skin was then approximated with fine silk sutures.

Three days later the report from the North Dakota public health laboratory was given as follows:

Chronic inflamatory tissue with numerous giant cells and epithelioid cells: Tuberculosis.

I was surprised at the report, and naturally I regretted that I had made such a radical removal of the growth. The stitches did not hold, and after a second attempt to close the wound, I decided that rather than attempt to close the wound by first intention, I would attempt to heal the condition first and then close the wound afterward, if necessary, by a second operation.

A general examination and X-ray of the chest were made by Dr. V. S. Quale with negative results.

In following a course of treatment, I had little to go by. Fuchs recommends excision and cautery. Stephenson has cured one case by X-ray. Bartos and Motto[2] affected a cure in a child of nine years within one year by the use of general light therapy and mild local astringents. Kiefer and Shulman[3] recommend tuberculin treatment. Hoffman[4] used either carbon arc or mercury vapor lamps with a "blue-uviol glass" filter in treating cases of scleritis, episcleritis, and phlyctenular conjunctivitis, but he says "whether eye irradiation lamps (i. e. these without compression equipment) are suitable for treatment of extensive tuberculous ulcers of the conjunctiva, we have no experience at the Berch Hirschfield clinic, owing to the rarity of this disease in East Prussia."

Experimenters with ultra-violet light tell us that the depth of penetration of this light into the skin is a small fraction of a millimeter. However, the therapeutic results of its local application as evidenced by the results obtained in the treatment of erysipelas and other comparatively deep skin infections very nearly prove that the local tissue reaction is much deeper than the estimated penetration of the rays themselves. Bearing this in mind, I tried the simple procedure of using ordinary unfiltered mercury vapor lamp therapy to the closed left eye twice weekly in gradually increasing doses, trying to avoid a skin reaction. Zinc sulphate one-half per cent t. i. d. was the only medication used. On April 26, the eye looked remarkably improved and the V-shaped area had almost completely grown together as though it had been

(*Continued on Page* 104.)

*Quoting from Fuch's Text Book of Ophthalmology: "The disease (tuberculosis conjunctivitis) occurs almost without exception in young people, and runs an uncommonly chronic course, being often protracted over a period of many years."

The Practising Physician's Role in Tuberculosis Today*

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THE opportunity of presenting to this conference a conception of the role that the practising physician plays in 1933 episodes of tuberculosis is a welcome one, because it brings to mind a picture which is far from colorless, and provokes a train of thought with a factual basis which is stimulating and encouraging. In this day of highly organized public health associations with their varied objectives, of numerous sanatatoria temptingly portraying the advantages of institutional treatment for tuberculosis, of still more numerous free dispensaries for diagnosis as well as post-sanatorium examination and advice, and in this day when progressive public institutions are initiating rational epidemiological programs which will unearth unsuspected symptom free early lesions as well as undiagnosed advanced cases—in such a day it may seem pointless but I think quite pertinent to see what part, if any, the practising physician does play in the face of the factors just alluded to which on first thought precludes him from any interest to say nothing of activity relative to tuberculosis in any of its various phases.

As I see it the practising physician has responsibility and opportunity along three clean-cut paths. His responsibility and opportunity in the diagnosis of pulmonary tuberculosis must remain unchallenged. More and more he is coming to appreciate that he is capable of making not only an early diagnosis but probably more important, an accurate one, in the big majority of demonstrable cases. He is aware in this day, that to attempt to make an accurate diagnosis on the basis of symptoms alone is fraught with many pitfalls and apt to work grave injustice to his patients. From my observations he is paying less attention, and rightly so, to many of the insignificant refinements in physical signs and coming to a fuller appreciation of the value of persistent upper lobe rales. He can attest to the illuminating results obtained from persistent examination of 24 hour specimens of sputum, resorting more frequently to guinea pig inoculation and culture methods where the microscope has not given a positive result. He is coming to evaluate more truly the significance in the history of hemoptysis and pleurisy. And by and large he is convinced that information afforded by well taken X-ray films of the chest is evidence of the utmost value that he can obtain in no other manner. Gradually too the practising physician is becoming aware of the importance of the skin tuberculin reaction in the diagnosis especially from the negative standpoint. It is well established that in many sections of our country an increasing number of people are reaching adult life with no tuberculous infection which fact warrants more use of the skin tuberculin test among adults as a negative reaction in obscure cases may prove most helpful. At present in some sections, due to marked but honest difference in opinion, he is somewhat confused regarding the significance and importance of a positive intradermal reaction to tuberculin of and by itself, but I am quite confident that in time as he studies the literature of experimental tuberculosis and as he reflects on the racial experience with tuberculous infection and tuberculous disease, he will be convinced in the vast majority of white persons having only tuberculous infection that the malignant possibilities of allergy are quite overshadowed by an increased resistance to reinfection. If this were not true most people in this country today would be dying from tuberculosis, because surely those of us who go thru life with no more than a positive Mantoux test must have had not only a primary infection but several, perhaps many, reinfections with the tubercle bacillus. In order that I may not be misunderstood here, let me repeat what I have said elsewhere; that I consider massive infection frequently repeated, especially in young infection free adults a dangerous affair and one warranting every possible precaution, going as far as establishing rigid medical aseptic measures in our hospitals and sanatoria.

One phase of this diagnostic problem, although apparent to few, needs much broadcasting. This is the importance of the symptom free lesions found in young adults, especially girls in the teens and early twenties. I am thinking here of the unsuspected and undiagnosed case discovered by Mantoux surveys, in the X-raying of college students, internes, nurses and other hospital employees, and young employees of large industrial plants, and especially that type of parenchymatous

*Read before the Mississippi Valley Conference on Tuberculosis, Kansas City, Mo., October 6, 1933, as part of a symposium, "1933 Episodes of Tuberculosis."

lesion which from the X-ray appearance is classified as exudative. The average physician I am confident does not realize that most of these lesions warrant treatment despite the absence of symptoms and here he can be of great help by insisting on treatment early rather than waiting till extension of the lesion occurs or breaking down of tissue becomes apparent or outspoken symptoms become manifest. And very shortly in such specialized meetings as this, we will be warmly debating the pros and cons of ambulatory pneumothorax for these people with unilateral minimal symptom free lesions. A few venturesome spirits are pioneering in this field now. Their first reports are being awaited with much interest.

The practising physician still occupies a very important place in the treatment of pulmonary tuberculosis. I thoroughly believe that the best advice a doctor can give a patient with active tuberculosis of the lungs is to seek a sanatorium which has a medical staff of good training and wide experience; a sanatorium equipped to administer modern treatment and one which insists upon a strict regimen. But with the number of sanatorium beds so far below the number of active cases needing such care it is obvious that someone must be treating them elsewhere and that "someone" is the practising physician and that "somewhere" is usually the home. Observations in my community lead me to conclude that by the large he does his job well. His opportunity to insist upon strict 24 hours bed rest while his patient is awaiting admission to the sanatorium does much toward preparing him for the months ahead. Fortunate is the physician who has a good sanatorium in his community and wise is he who periodically visits patients whom he has sent there to follow their progress. In this and no other manner will he be able to assume that most important period of after-sanatorium care when his patient needs not only an intelligent doctor but a doctor friend who appreciates all he has been thru and what he still must overcome before he attempts resuming his place in the social and economic order of things.

The treatment of tuberculosis of the lungs and its complications has undergone rapid and significant changes in the past ten or twelve years. The marked increase in the number of patients receiving collapse therapy, the importance of serial X-ray examinations during treatment, the value of blood studies and sedimentation rates in treatment and prognosis are known to those of us here but are not fully appreciated by the average practising physician for various and good reasons. Short courses in Minnesota sponsored by the Minnesota Public Health Association and held where possible in the county or state sanatoria have been most helpful in keeping these busy men informed regarding advances and trends in the diagnosis and treatment of tuberculosis and in the main they have responded enthusiastically to the opportunity. Would it not be wise for all our State Public Health Associations to adopt this "short course" idea as a part of their permanent program for the simple reason that the practising physician has been and is the first line of defense and offense in this anti-tuberculosis fight? The better informed he is the stronger will our defense and attack be because people when ill still rightly turn to their physician for help and will continue to do so.

In the public health and epidemiological phases of tuberculosis the practising physician should play an important part and in many communities does. He is interesting himself more and more in the administrative end of public health activities as he comes to realize that such work without sane well-informed medical counsel is bound to fail in its objective of better health for the community. No board of directors of any public health association should be without an ample quota of practising physicians. In actual field work he has a definite place and is responding to the opportunity. As an example I may cite the Mantoux surveys conducted in the high schools of St. Paul and Ramsey County during the past three years. The necessary preliminary contacting and clerical work were done by the Ramsey County Public Health Association, but the testing, reading of the reactions, and X-ray interpretation were all done by physicians practising in St. Paul. During these three years some 4,936 tests have been given. One thousand five hundred and thirteen, or 30.6 per cent were found positive. Among these positive reactors 186 (3.8%) childhood type lesions were found and 15 (.3%) adult type, all the latter being unsuspected. This experience has been repeated in many other communities in Minnesota thru the help of the Minnesota Public Health Association and the various county sanatoria and the state sanatorium. And still more stimulating is the report of Doctors Simon and Hilleboe[1] of Swanville, Minnesota, which beautifully illustrates what can be done in rural communities by alert and progressive practising physicians. Not only did they discover 19 cases of pulmonary tuberculosis and search for the human sources of infection but they ventured into the bovine field as well.

(*Continued on Page* 92.)

Then and Now*

Gilbert Cottam, M.D.
Minneapolis

TONIGHT I find myself in a very unusual situation. To be given a whole evening in which to talk to an eager, expectant throng on any subject I might choose is something that simply could not have happened in the young life of this organization. The early members with whom I was associated in the natal days of the Sioux Valley Medical Association would have taken no such chances, at least they never did. But now many of these have gone the way of all flesh and here tonight are their sons and even their grandsons, trustingly offering me this opportunity to do the thing which their forebears would have denied me, in self-protection. I thank you for your faith and I shall try to repay you by limiting myself at least in point of time and to ensure this my friends Adson, Marx White, William Jepson and Ralph Parker, the genial executive secretary of the Iowa State Medical Association, have kindly co-operated by consenting to occupy some of the time themselves and I am sure that we have all enjoyed their efforts.

Things are very different now from the way they were in May, 1896, when this association first saw the light of day. In those days, five years before the reorganization of the American Medical Association, the interchange of ideas between members of our profession was as limited as were the facilities under which we worked. We had mud roads, horses, buggies, baseburners, spittoons, kerosene lamps, stairs to climb and the most rudimentary plumbing. Elevators, steam heat, janitor service, office girls, typewriters, telephones, electric lights and automobiles were unknown and the lack of conveniences like these certainly hampered us in the practice of our profession. But giants had stalked in the land long before that and had left sturdy footprints. Men like Auenbruegger with his percussion, Laennec with his stethoscope, Helmholz with his ophthalmoscope, Claude Bernard, Virchow, Rokitansky, Pasteur, Robert Koch, Lister—the list grows apace and there is but a start. There were hordes of others and to follow their teachings was to practice scientific medicine. We were forced to use our five senses and do real thinking, for we could not glibly fall back on the X-ray, the laboratory, the electrocardiograph, the sphygmomanometer and the metabolism machines which we find so essential nowadays and I sometimes wonder whether, in this machine age of diagnosis in which we now live we have not lost something else by having all these things added unto us.

But I am ahead of my story and to go back again for just a moment, the point I wish to make is that having all the handicaps under which we labored in those early days seemed to make us yearn all the more to mix together and so it was easy to interest the professional men of the territory adjacent to the intersection of the four states, Iowa, Minnesota, South Dakota and Nebraska, to form this organization, for at that time there was nothing of the sort available in that area. Our early programs were typical of the times and followed closely the kind of medical teaching which prevailed in the same period. Clinical teaching, as we know it today, simply did not exist and we were therefore dependent for scientific pabulum on purely didactic papers and not many of these. Indeed, to fill out the time and avoid running out of material we used to occupy the morning meeting of the first day with "exercises." These consisted of a deadly ritual, beginning with the call to order, and a long drawn-out prayer or invocation as it was called in which a clergyman was supposed to pray for divine guidance on our efforts but which usually resolved itself, after looking us over, into an intercession on behalf of the country at large. Then came the address of welcome by the mayor or his accredited representative, followed by a response by a member from another town, who could be depended upon to be glad he was away from home. Perhaps a bit of music by a male quartet then helped to kill a little more time and then came the president's address, usually a thesis on the work of Galen or something of the sort and then began the program in earnest.

Things did not go on this way for long. With the improvements in living conditions, the betterment of medical teaching in the schools and the establishment of hospitals with modern organization and equipment the programs of our meetings kept pace and throughout the years the good work of this association in affording its members periodical

(*Continued on Page 92.*)

*Summary of remarks made at the banquet of the Sioux Valley Medical Association in Sioux City, Iowa, on January 23, 1934.

Clinical Notes of the Interstate Post-Graduate Assembles 1932 European Tour

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(Continued from February 1st Issue)

After his lecture we were taken on a ward walk through the hospital where we were shown their method of taking care of confinements. They do not believe in tub baths during the last six weeks previous to confinements. No tub baths are allowed at the hospital. No patient is allowed to go to the toilet. Each has her individual bed pan while at the hospital. Normal deliveries are all done by the midwife. Doctors are called only when there is some complication. All of their beds are made in two sections, separated in the middle, each half having its own mattress. The babies are all delivered in bed and when the delivery occurs, the lower half of the bed is wheeled away and stirrups attached to the remaining portion. They do not drape their patients; at the time of delivery a woman is absolutely naked except for a short nightgown over her chest. The midwife notes the progress of the case by rectal examination; no vaginal examinations are allowed. All of the pelvic measurements are made by the midwife. They pay great attention to and chart all of the pains. A normal delivery takes about two hundred pains, usually twenty-five pains after the membranes rupture. In a multipera the pains vary from one hundred to one hundred and seventy-five. He thinks it most important to count all of the pains. The third stage of labor takes from twenty-five to thirty-five pains. The head should engage after twenty-five pains following complete dilatation. After the head is engaged and there is no progress after twenty-five pains in a multipera or fifty pains in a primpera, he thinks it is time to interfere because of the danger of rupturing the uterus. Patients are never allowed to wash the nipples at any time. They apply a pad soaked in vaseline one hundred, boric acid ten and balsam peru two. He has not had a case of mastitis in 1,800 cases.

Professor Walthard also showed us a corposcope invented by Dr. Hinzman of Germany. It looks like a powerful binocular so arranged that a strong light is focused on the cervix, by examination of the cervix through this instrument at a distance of eight or ten inches, the tissues are greatly magnified. He thinks he is able to detect cancer of the cervix five to ten years before it occurs on account of the tendency to leukoplakia which he is able to discover with this instrument.

In case of uterine or pelvic infection, in order to determine when to operate, they first measure the patient's immunity to the organism present. A broth culture of the uterine secretions is first made and innoculated into the patient's own blood and a gelatine plate made. After six hours with the aid of a strong magnifying glass the colonies are examined to see if the growth is advancing or being retarded. When the patient's blood shows a bactericidal action on the organisms, they are ready for operation.

From Switzerland we crossed the German frontier on our way to Munich where we attended the clinic of Professor Lexor. He is a man of sixty-five years of age and is one of the most remarkable men we met on our trip. He is a typical German, but has a saving grace of humor. He first took us into an anteroom and gave us gowns, then showed us a picture of some visiting American doctors. The picture had been taken from behind and showed the doctors with their hands in their pockets and with their gowns open in the back. He thought this was a good joke, and we took care to see that our gowns were properly buttoned. Professor Lexer speaks good English. To my mind he is one of the greatest plastic surgeons of our time.

His first operation was on a woman eighteen years old with hypertrophy of both breasts. He did a plastic operation, lifting both breasts to their normal position at the same time resecting a large section from each breast in order to reduce them to their normal size. The patient was asleep when he brought her in, under avertin rectal anaesthesia. He used a table of his own in which the patient was in a sitting position with the arms extended and the legs strapped to rests on the table. In this way both breasts were symmetrical at all times during the operation. He handled the case as a sculptor would handle clay. He sat on a stool facing his patient. First a pin was placed in each breast at a point where he wanted the transplanted nipple. This pin was not removed until the disection was completed. An incision was made around the areola of the nipple. A similar incision was made around the pin and the skin around these removed. Parallel incisions

extended to the lower border of the breast where they branched out at an angle of forty-five degrees on each side. These incisions extended through the fascia to the breast proper. A V-shaped segment was then removed from each breast in order to reduce them to normal size. The cut sections of the breast were closed with two layers of interrupted sutures. An incision was made through the fascia of the chest at the lower border of the transplanted breast. This was reflected over the breast in such a manner that it supported the breast as if it were on a shelf. The nipple, together with the areola and breast, were moved upwards and fixed in normal position. When the skin was closed, there was one line of suture extending down from the nipple to the lower margin of the breast. He applied tin foil to the wound, then supported the breasts with a large dressing extending over the shoulder. It was a remarkable operation.

His second case was that of a young girl with complete ankylosis of her right hip following drainage years ago. The leg was flexed and ankylosed at a right angle. He exposed the hip through a Kocher incision. With a large chisel the greater trocanter with its muscles attached was removed and disected upwards. Then with a large curved chisel, he entered the acetabulum from behind, using a mallet to drive the chisel under the head of the bone until he was able to lift it out of its socket. It is unbelievable how much force it took to separate the head of the femur from the acetabulum. I thought he would drive the chisel through the pelvis, but he never hesitated, never removed the chisel to take a look but simply knew he was right and went ahead; finally, the head came out like a nut from a husk. With a Murphy remur the acetabulum and head were modeled.

His third case was a boy with congenital absence of one ear. In a previous operation a piece of cartilage from the ribs had been transplanted into a flap made on the boy's arm. The edge of this flap was now attached to the side of the head and the arm was held in place over the boy's head with adhesive.

He did one operation for reconstruction of the nose. The tip of the nose was flat, giving it a rounded appearance. The tip of the nose was propped up by running a subcuticular graft of cartilage taken from the costal cartilage under the skin along the ridge of the nose down to the tip. This was introduced through a small cut between the eyebrows. A stitch was taken at the upper end to hold it in place. In order to make doubly sure that it would stay, he cut a piece of bone from the crest of the tibia, placing it as a prop subcutaneously just under the cartilaginous aseptum, one end resting against the splint and the other resting against the superior maxilla. This made a very beautiful nose out of one that at first looked impossible. As a dressing for the nose, a large cork was split in the middle and strapped with adhesive, one-half on each side of the nose.

The following day we took a train to Vienna. Professor Eiselsberg lectured to us for an hour in the old historic amphitheatre where Billroth, his predecessor, used to work. Vienna is still the leading medical center of Europe. The American Medical Association is still being maintained by the American doctors, there being about sixty-five registered when we were there.

Professor Denk's first case was an enormous defect of the forehead following gunshot wound, and in 1919 the man had developed epilepsy. An enormous cyst had developed in the frontal region of the head. The doctor filled this cavity with fat taken from the leg and abdomen. When Professor Denk was asked if such an enormous amount of fat would live, he assured us that it would, and sent his assistant after pictures of similar cases which he had operated.

He had one case of hour glass stomach in which he resected the greater curvature at the constriction.

We had a two-hour clinic with Professor Weibel at the Frauenklinik. Professor Weibel reminds one of an artist. He has long, delicate hands and wears his hair down to his shoulders. His technique is extremely simple. He did a complete Wertheim operation for cancer of the cervix, and it was the most beautiful demonstration I have ever seen. I do not believe there is another living man who could do a Wertheim as skillfully as he did.

We spent an afternoon in the fracture ward of the Allgemeines Krankenhaus. They showed us their method of treating fractures of which they have a great variety. They have modified their technique in fractures of the spine. All fractures of the body of the vertebrae are reduced under local anaesthesia. This is done as soon as the paralytic ileus has disappeared, usually three to four days after the accident. They reduce them according to what they call the American method by suspending them in the air, only in place of suspending them by the feet in the "swan dive" position as we do it, they suspend them by the head and shoulders. This seems more difficult to do, but the end result is the same. In place of having their patients in bed for several weeks following reduction, they get them up as soon as the cast is dry and then allow them to exercise.

They showed us their method of exercise and this treatment seemed very superior to the old method of allowing them to stay in bed for weeks and months. They have them carry sand bags, weighing from sixty to eighty pounds on top of their head. This is done to develop the muscles of the back. They also employ Swedish movements.

Boehler's method was used in fractures of the os calcis and a Kerschner wire was used to hold the fragments in place after they have been reduced. They use a spring scale in series with a pulley in order to measure the amount of pull. In fractures of the leg they allow them to stay in bed until the swelling disappears before they put on a cast.

We spent an afternoon at the Boehler Institute, which is a clearing house for compensation cases. They have one floor where they keep cases that are confined to bed. A large bulk of their practice is the treatment of ambulatory cases, and they make an effort to get as many cases as possible up and round. Dr. Boehler used the Smith-Peterson pin for intracapsular fractures of the hip. He showed us several cases who were up walking without the aid of crutches or casts after ten days to two weeks.

We spent a morning with Dr. Finsterer at his private hospital. He has quite a reputation in gastric surgery which he does under local anaesthesia using local infiltration for the abdomen, then injects the splanchnic nerves with 70 cc. of one-half per cent novocain for his deep anaesthesia. In doing this he uses a long needle, runs his finger down between the aorta and vena cava, introduces the needle along his finger, injects his solution and sucks it back and forth several times. This gives him perfect anaesthesia. He claims gastric ulcers are due first to hyperacidity and second to nicotine.

He operates on practically all of the cancer cases that come to him. If the cancer is adherent to the pancreas he does not try to remove the adherent portion but leaves a piece of the duodenum attached to the pancreas. His operation was started in the mid-portion of the greater curvature. Every vessel was ligated individually and not in mass. By doing this he claims he has perfect circulation in his mesentery and transverse colon. He said there should be no congestion in these organs after resection. He claims that after a gastroenterostomy a patient must diet for life. After a gastric resection they eat with care for eight months, then can eat anything. All of the vessels were ligated with silk.

In a gastric resection for duodenal ulcer he used one clamp on the stomach side but none on the duodenum. Out of 1,600 gastric resections he has done Billroth I in only 300 cases. He claims the immediate mortality is greater and the permanent results are no better after a Billroth I. He used three rows of sutures in all of his anastomosis and stated that it takes time to do the operation in this way, but said that he had plenty of time.

On June twentieth we visited the gynecological hospital of Dr. Adler, located in the soldier's military barracks constructed during the war.

Of the cancer cases that come to him, he operates sixty-one per cent. He has an absolute cure of thirty-six per cent. Practically all of his operations for cancer of the cervix are done through the vagina. The mortality by the vaginal route is three and one-half per cent, while by the abdominal route it is fifteen per cent.

He operated on a case of cancer of the cervix according to his method. It was in a stout woman forty years of age. She had never had any children. She had a contracted vagina which would admit only one finger, so in order to get sufficient room he made a Schuchardt's incision through the labia and the levator ani muscles. When we first saw this case we thought it would be impossible to do a hysterectomy through the vagina, but the Schuchardt's incision gave him fair exposure. He first incised the vagina about one inch from the cervix stitching this flap over the cervix so as to make the operation as aseptic as possible. He then separated the rectum from the uterus and isolated the ureter on each side. It is unbelievable how easy they were to find. With a bayonet retractor he pushed them to one side, then flexed the fundus of the uterus into the vagina, clamped and ligated the broad ligaments at the side of the pelvis, while the ureters were retracted by his assistant. He ligated the uterine and ovarian arteries separately. The vagina was closed with a stump of the broad ligaments protruding through its vault, in order to prevent prolapse of the bowel. Forty milligrams of radium were then introduced on each side through a stiff rubber tube. The ureters were held out of the way by a pack of iodoform gauze. An inlaying catheter was used in the bladder. Six or seven postoperative treatments of radium are used beginning three months after the operations. He has a speculum for rectal applications. He also did a case of sterilization through the vaginal route under local anaesthesia. It was done through a median incision in the anterior vaginal wall. The bladder was disected off and the fundus delivered. The tubes were cut and sutured to the posterior por-

tion of the fundus at the same time shortening the round ligaments.

At the Allgemeines Krankenhaus we heard a lecture on parathyroid tumors given by Dr. Gold. Dr. Gold said that Von Recklinghausen's disease and Paget's disease are not the same. Paget's disease is not dangerous while in Von Recklinghausen's disease, which he thinks is due to parathyroid tumor, patients die early, usually from complications of the lungs. Of thirty cases which he had traced, twenty-eight had died and the others were very sick.

Dr. Gold showed us one woman whom he had operated five years before. Another case he operated one month before was a girl who had a pathologic fracture of the femur. The disease is characterized by pain and cystic formation in the bones. After removal of the enlarged parathyroid, the pain disappears and there is improvement in the bones. The calcium balance becomes normal but often the cysts do not disappear without operating. He showed us some enlarged parathyroids. They were about one-half inch in diameter and could easily be recognized when found. They are sometimes within the thyroid gland, therefore, difficult to find. Dr. Gold thinks that sometimes they may be located in the thymus. When he fails to find them he uses X-ray treatments.

In the evenings we took a post-graduate course in anatomy at the pathologic institute. The young fellow who gave us this course had a method of teaching which was quite different from the ordinary disecting room method. For example, in showing the triangles of the neck he first drew them on the blackboard and told us where they were and how they were formed, then pointed them out on himself and then on the disected specimens.

From Vienna we went to Prague in Czecho-Slovakia. They have two universities in Prague, the German and the Czech. The Czech university has been started since the war and seems to be in a flourishing condition. The German university is an old institution.

Professor Jirasek gave us a clinic at the Czech university. He has a great quantity of material. He is a general surgeon covering a wide field. He showed us a case in which he had done a sympathectomy for angina pectoris. Following the removal of malignant tumors of the cord he applies radium direct to the cord. He operated for syringomyelia and for spina bifida. He thinks lipiodol is of no value in these cases. In case of spinal dislocation, he thinks they should be operated upon but the end result is not always good.

On June twenty-fifth we visited the clinic of Professor Sauerbruch in Berlin. He is still the best showman in our profession. He has a new pavilion and his operating room is three times the size of the ordinary operating room. He had no less than six side tables filled with complete sets of instruments. I counted ten needle holders on each operating table and the nurse that waited on him had to be extremely dexterous in order to keep him supplied. He had the instrument table back of him while operating and he never looked for an instrument but she seemed able to hand him the right instrument at all times. When through with it, he simply tossed it back of him onto the table. The instrument usually landed, otherwise there was another instrument ready.

His first case was an extrapleural thoracoplasty which he did in a way for which he is famous. He did a complete radical amputation for cancer of the breast in exactly two minutes.

His next case was an enlarged pathologic gallbladder. He aspirated the bile before removing the gallbladder. His abdominal packs were applied in a unique way. He first spread one pack over the wound, folded the second pack and put it in the middle of the first, then pushed them both together into the depths of the wound. His second pack was inclosed by the first. This method walled off the bowels quickly and he was able to remove the gallbladder in two minutes.

His fourth case was a resection of the colon in two stages; we saw the first stage. The colon was mobilized by Kocher's method, cutting the outer leaf so that it could be lifted out of the abdomen.

His fifth case was an abscess of the right lung. One rib was resected anteriorly. The pleura was adherent so with a cautery he punctured the lung until he struck the abscess cavity.

After his operative schedule he took us to the amphitheatre for a lecture and demonstration of cases. I have never seen such an array of surgical material demonstrated in so short a time. He showed us sixty cases in one hour. These cases had been gathered from all parts of the city and were in the ante-room all stripped and ready. As each patient was shown, one assistant brought the pathologic specimen and another showed charts illustrating the operation. There were three cases of brain cysts and several cases of brain tumors. He showed us a variety of cases of mediastinal tumors in which the patients seemed perfectly well. He said that surgery of the mediastinum is the youngest branch of surgery.

Professor Sauerbruch had numerous patients in whom he had operated upon the esophagus. We were shown nine cases in which he had made artificial esophagi. All of these cases looked strong

and well nourished. In operating upon the esophagus he usually makes his incision in the left chest parallel to the ribs, incising the diaphragm and approaching the mediastinum through this incision. He showed us two cases in which he had resected the esophagus and anastomosed the stomach to the cut end by pulling it through the diaphragm.

He had a series of cases in which he had done lobectomies for lung abscesses, also one case in which he had done a lobectomy for congenital bronchiectasis.

His interest at present seems to be directed to surgery of the lungs and the mediastinum. He had numerous cases of extrapleural thoracoplasties which he paraded before us. We saw a case where he had resected the entire humerus and transplanted a fibula in its place. This man had a good functioning arm as a result of the operation.

One patient had lost both hands at the wrist. Dr. Sauerbruch made artificial hands for him and by a method of his own had made it possible for him to move the fingers of his artificial hands. The man was able to open a box of cigarettes, take out a cigarette, open a box of matches, take out a match, light his cigarette and put the box away in his pocket. On my last trip to Europe I saw a nurse who had lost both hands, fitted with similar hands. She was able to knit, peel an apple and comb her hair. Professor Sauerbruch said he did three thousand of these operations during the war. The operation consists of the usual amputation but in addition a hole is made through the extensor tendons or groups of muscles through which skin is grafted to make a permanent opening. A similar hole is made through the flexor group and through these openings he inserts wooden pegs, one on either side. These are attached to the artificial hands. The patient can then close the hand by contracting the flexor group of muscles and can extend the fingers by contracting the extensor group of muscles.

At Frankfort we visited the clinic of Dr. Schmieden who is one of the outstanding surgeons of the world. We were shown his method of injecting the patient's blood to stimulate callus formation in un-united fractures of the tibia. He injected about 50 cc. of the patient's own blood between the ends of the bone and under the periosteum. The injections must be repeated every two weeks.

He showed us his method of dilating strictures of the esophagus with the use of a special instrument introduced through the mouth. This is also used in all cases of cardiospasm which he thinks is due to fissure of the mucous membrane of the esophagus. His goitre operations were done under local anaesthesia. He reflected the upper flap only and sutured it to the side of the neck to hold it out of the way while he was operating. He did not turn down the lower flap. The gland was mobilized by cutting and ligating the superior thyroid artery first. He then ligated and cut the lateral vein and pushed it out of the way before lifting the gland. The goitre was partly retrosternal and in order to lift it out of the mediastinum, he inserted deep sutures of silk into the gland using them as tractors. After the inferior thyroid had been ligated, all of the vessels going to the gland were ligated before he made traction on the gland.

Dr. Schmieden operated in the amphitheatre. In the adjoining large operating room were four operating teams working at the same time.

At the first table his first assistant was resecting a stomach; a case that had previously had a gastroenterostomy performed and had developed a peptic ulcer.

At the second table one of his assistants was doing a gastric resection for duodenal ulcer.

At the third table another assistant was removing a pathologic gallbladder.

At the fourth table a fourth assistant was removing a polynoidal cyst in the region of the coccyx with a diathermy knife. He announced before he started that there were two cysts one on top of the other, and the under one was the larger. After he had removed the first cyst he began to disect the second one with the diathermy knife and the more he disected the larger it seemed to grow. Finally by using the needle he discovered he was working on the rectum. This discovery was made before any serious damage had been done.

In the afternoon we visited the X-ray department. It is one of the most complete in Europe. They have a new building costing about $200,000. They make their own X-ray machines. They have a powerful machine using 200,000 volts for therapy. Formerly they gave massive doses but now they have come to the conclusion that small repeated doses give better results. They have given up the idea that they can kill the cancer cell and only hope to prevent mitosis. They said that radiotherapy follows physical and optical laws and cannot be applied mechanically without study and care in its application. On account of the depression they are having great difficulty in buying X-ray films and are now using paper films instead. These films are very much cheaper and for many purposes are just as good as celluloid films.

The next day we visited the clinic of Dr. Seitz. He operated on a case of sterility in a girl twenty-eight years of age. The abdomen was first opened and the tubes examined. While the tubes were exposed air was insufflated into the cervix, the amount of pressure being measured by a manometer. His first two attempts were unsuccessful but his third attempt with 250 millimeters of air pressure, was successful and the air passed into the tubes until they became distended.

We spent a day sightseeing at Cologne and from there we went to Hamburg for two days of clinics.

Before taking the President Roosevelt back to the States several of our party flew from there to England and the Scandinavian countries for an extended tour. Others left the party at Cologne and spent a week in England and Ireland catching the Roosevelt at Colb. In command of the Roosevelt was Captain Fried, who is famous for his many rescues at sea. It was his last voyage on this ship as he was to be transferred to the new Manhattan which was then ready for its trial cruise.

THE PRACTISING PHYSICIAN'S ROLE IN TUBERCULOSIS TODAY

(*Continued from Page* 85.)

As the results of these surveys have been announced each year in St. Paul an increasing demand for properly and freshly diluted tuberculin supplied by the Ramsey County Public Health Association has been noted, which is being used physicians in their private practice, meaning without question an awakening interest in tuberculosis.

I my consultation practice I am finding more frequently that once a case of tuberculosis has been found in a family the others have been given the Mantoux test and have been examined by the family doctor. I have noted also that the slogans adopted and the literature issued by the National Tuberculosis Association in recent years have done much to revive our almost forgotten knowledge that tuberculosis is after all a communicable disease. Not only are more questions being asked by patients and their families regarding precautions against transmitting infection but it has been my observation that they have more thorough instruction than in years gone by from their own physician. This, of course, is not only encouraging from a preventive medicine standpoint but also I believe clearly indicates that the practising physician is far from being out of the tuberculosis picture and that he has not lost interest as many believe. I am confident that his interest will continue to rise as he is given a more active place in the scheme of things relative to tuberculosis work.

The Mantoux surveys have done much toward reactivating this interest which has appeared dormant. If I may again refer to our experience in St. Paul, the parents of the reacting children are advised by letter as to the results of the test and X-ray findings and are requested to take the child with the letter to their physician for an examination and advice. Each year finds an increasing number of doctors coming to see the X-ray pictures, more and more inquires as to the latest views regarding the significance of positive reactions, the importance of calcified areas, etc. It all results in their becoming more tuberculosis minded which is a worthwhile objective beyond argument.

In brief then these are some of my thoughts regarding the place of the practising physician in the 1933 picture of tuberculosis. He is a part of that picture which we can ill afford to disregard. And rather than continue to scold and lecture him for deficiencies for which he may or may not fairly be held accountable it would seem much wiser in the interest of ultimate results to engage in more sincere attempts to catch his interest and hold it by genuine co-operative efforts. This tuberculosis fight needs the practising physician and on the other hand he can profit by the new knowledge of tuberculosis which intensive study has brought to light. Such mutual need can and must be fulfilled.

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THEN AND NOW

(*Continued from Page* 86.)

opportunities to add to their store of professional knowledge has been noteworthy and much good has been done. As I look back on the period of nearly forty years in which it has been an active agent of scientific improvement in the profession of this area I see concrete evidence of its worth on every hand. Regardless of what has happened in an economic way the thirst for improved knowledge has gone on and the medical profession of this section has never faltered or grown stale.

The
JOURNAL LANCET

Represents the Medical Profession of
MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA

The Official Journal of the

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South Dakota State Medical Association
The Hennepin County Medical Society
The Minnesota Academy of Medicine
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MINNEAPOLIS, MINN., FEBRUARY 15, 1934

PERSONAL CLEANLINESS OF FOOD HANDLERS

The insurmountable difficulty of making a complete routine and periodic examination of all food handlers is not apparent until one considers the huge army of workers that would be required to do the job.

At a conference attended by Dr. G. W. McCoy, director of the national institute of public health, Dr. A. J. Chesley, of the Minnesota state board and other health officers from this section, it was agreed that any attempt to make wholesale examinations of public food handlers is inadvisable.

Personal cleanliness is the keynote to safety. The standards for sanitation and personal hygiene should be maintained on a high level both in public places and in private homes and institutions.

The Chicago outbreak has been much heralded, but other sources must be constantly borne in mind. It is interesting to note that out of 663 cases of amebiasis in Minnesota, from 1917 to 1932, 447 were reported by the veterans' hospitals in ex-service men, and 123 were reported by a clinic in Rochester, leaving 93 to be otherwise accounted for during a period of fifteen years.

A. E. H.

DIAGNOSTIC ROENTGEN FILMS OF THE CHEST

Routine Mantoux tests of children in certain areas and schools, with a search for contacts, is now one of the highly merited moves for the ultimate elimination of tuberculosis. The follow-up renders imperative certain roentgen films taken in a rather broad scale. This brings up the question of where the films shall be taken and the writer wishes simply to discuss the matter of technique.

X-ray machines are very widely distributed among physicians. Not a few technical difficulties obtain in terms of local fluctuations in current or type and vintage of the transformers; however, (speaking only as one who knows a good chest film when he sees it, but has not taken one for fifteen years) there seems to be a most fertile field for some well trained expert to visit many physicians' and hospitals' X-ray laboratories and demonstrate upon actual patients a standardized technique. It would likely be found that faulty results are to be found in poor timing. inadequate or old intensifying screens, tubes not adapted for every picture need and very hit-and-miss developing mixtures.

A man comes to mind who in the regal days of the middle twenties bought a new car every time he couldn't find the pair of pliers that nestled with the "full equipment." Something of this order may obtain with many excellent

doctors harrassed by endless detail and forced to carry on as best he can office details that should be in the hands of the many technicians now so splendidly trained, but sadly unemployed. Memory carries me back to the very fair indeed chest plates (heavy glass) first seen with Holzknecht and Kreisfuchs in Vienna twenty-three years ago. The equipment was of course crude, but Michael Angelo's chisels were not especially fancy either.

So much depends upon proper X-ray chest films in this crusade for tuberculosis prevention that it does not seem amiss to suggest a plan fostered by those furthering the movement, to help in this mechanical way. This should come not from a super-salesman with a fine set of stream lined models. Those technically trained state that the average transformer can be made to deliver diagnostic films if certain rules are followed or minor equipment is added. This investment might well be productive if more preventive work could be done locally rather than in our urban centers or sanatoria clinics. The idea is advanced for comment. The cost must always be considered but film cost is the same whether the product is bad or good.

E. L. T.

OSLER DID NOT SAY IT

It was coming spring in Baltimore in 1905, February to be more exact, when John Hopkins, medical school set aside and designated an "Osler Day" on which to honor one who had served it conspicuously for many years, and who was now about to leave and assume the duties of his newly accepted office as Regius Professor of Physic at Oxford.

Few of the medical students had ever been on the campus of the university proper, but on this occasion many of them eagerly inquired their way across the city in order to be present and hear what their beloved teacher might have to say on his departure. There was a colorful cap and gown parade of faculty members, and soon every seat in the auditorium was occupied. Halsted and Kelly were there. Futcher and Thayer were there. Harvey Cushing was at that time a member of the surgical staff and makes brief reference of the incident in one of his *Consecratio Medici* addresses. Osler was given the seat of honor on the platform with former president Gilman on his left, and president Remsen, himself an old man, on his right. Because Osler's remarks on this occasion have been much misquoted, one who was there would like to tell them as remembered by him now, in abbreviated form.

He began by saying "Those who know me best, know that I have a hobby: I am a great believer in the young man!" He went on to say that, with rare exceptions, creative thought and new inventions were the products of younger minds, and that some scientists would even insist that they were impossible after 40. He cited many, many instances but conceded too, the "exceptions of those who appear to have been endowed by perpetual youth." And then came the sentence that was misquoted so much and sent broadcast by a sensational press. "I would *not* go so far as to say that men should be chloroformed at 60 as was suggested by Anthony Trollop in his novel *The Fixed Period* because I am too near that age myself." To his friends who understood him, it was just another way of saying: "You are making too much fuss about my leaving. It will not be such a great loss. I am getting old." Thus he exemplified his own teachings in his *Aequinimitas* essay. "That a due humility should take the place of honor on the list."

A. E. H.

THE NECESSITY OF MEDICAL CO-OPERATION

A new angle of the relation of the physician to the public has recently come to the fore. It took the depression to awaken the medical profession to a situation which has existed for years and which has had all the qualities of the ridiculous. We believe that medical men have long been aware of their responsibilities to the public and we are certain too, that generally they have recognized them and discharged them with honor and credit. Indeed it is apparent that they have been over zealous in this regard, if that could be possible for a group of men with the high ideals that characterizes the medical profession. The new angle in the case is that the medical profession at last realizes that the public has responsibilities to them that have not been recognized. For a long time physicians have served the indigent public, usually willingly, without adequate compensation except in isolated cases. The realization of this injustice, already long existant, came about during the immediate past, when the list of indigents increased so rapidly. It is gratifying to see how, all over the country, the profession has responded to correct the evil.

In North Dakota the burden of correcting this defective relationship has been undertaken by the

Committee on Medical Economics of the State Society. They have done a splendid work. In brief, the proposition which it selected for presentation to the various county and city organizations responsible for the care of the indigent sick, is fair both to the officials and to the profession. In essence, the plan abolishes the appointed county or city physician and substitutes for him the whole profession in good standing in the community. The fee schedule, though reduced approximately one third below the prevailing minimum scale, is fair. One of the most gratifying results of the scheme is that aproximately twenty of the county boards have expressed their willingness to adopt the plan and are anxious to co-operate. Perhaps this spirit of co-operation was due in large measure to the manner in which the plan was presented. Committees from the local medical societies and members of the state committee in some instances waited upon the Commissioners and discussed and explained the plan in a business-like manner. Dictatorial attitudes were avoided and in no case was the plan presented as an ultimatum. The committees tried to impress the commissioners with their desire to co-operate to their mutual advantage. In order to protect the commissioners from attempts to exploit the opportunity by isolated and misdirected physicans, a representative committee from the local society will arbitrate any disputed case.

The consummation of such an arrangement and the recognition by public officials of their obligation to the medical profession, we all agree, is pleasant to contemplate. However, in spite of the fact that medical men have honorably discharged their obligations in the past, they will necessarily incur new obligations under this plan. The individual physician now, more than ever, is obligated to honor his responsibility toward public officials and be more fair than ever with them. Any attempt at exploitation will be ruinous to the plan. Further, he is more than ever obligated to be fair with his fellow practitioners. Obstructive tactics to further selfish ambitions have no place in this crisis. We need the co-operation of every man, whether he is in or out of his local medical society. The principle here involved concerns medicine's future, not only the exigency of the present. Those men who in the past have violated the code of medical ethics insofar as it pertains to the honorable relationship with their colleagues; those men whose unethical conduct has largely been responsible for what lack of confidence the laity has placed in the profession at large, and who are in a measure indirectly responsible for the growth of the irregulars; those men need an awakening. They should be brought to a realization that the problem of the profession is their individual problem and its solution lies in the expenditure of co-operative effort. J.O.A.

GUDMAN J. GISLASON

Dr. G. J. Gislason was born in Iceland, January 21, 1877, and passed away at his home in Grand Forks, January 3, 1934. He came with his parents to what is now North Dakota in the summer of 1883 and thus for a full half century was in close touch with life on its prairies, which incidentally he loved so well. He received his early education in the schools of his home county, Pembina, and took Academic studies for three years at Wesley College, Winnipeg. He later secured his B. A. Degree from the University of North Dakota.

Dr. Gislason graduated in Medicine from the University of Illinois in 1904, and was licensed to practice in North Dakota in the same year. He then established an office in Grand Forks, North Dakota, where he afterwards continuously resided, with the exception of time spent in graduate study at home and abroad. He was a Fellow of the American College of Surgeons and was elected first President of the North Dakota Academy of Opthalmology and Otolaryngology in 1919. He also held the position of President of the Grand Forks District Medical Society. His practice was confined to Eye, Ear, Nose and Throat, perfecting himself in these subjects by intensive and prolonged study in Vienna, Berlin, London and Edinburgh.

Dr. Gislason was an unusual character in many ways. He had a rugged personality and a nobility of character that was outstanding. He faced facts as he saw and interpreted them with force and determination. No one remained long in doubt, as to where he stood, when any matter was up for discussion.

He loved his native land, its people and its institutions and rejoiced in the contributions they have made to the world's progress. In acknowledgement of his interest and ability he was appointed by Governor Shafer of North Dakota as his official representative to the Millenium Celebration of Representative Government in Iceland in 1930. He was an earnest student of Icelandic literature and made many excellent translations from his native tongue into English. At the time of his demise he had in preparation a life of Lief Ericson. There had also appeared in leading periodicals at various times from his pen, original poems of much merit.

As a physician he was accomplished and skil-

ful; as a citizen he took an active interest in the affairs of church and state and stood for the best in Civic and community life; as a friend and associate he was genial, honorable and dependable; and in his home life he was considerate, sympathetic, kindly and affectionate. He was at his best, with family and friends around his own fireside.

In the passing of Dr. G. J. Gislason the profession loses an honored member, the state a loyal citizen, his church a faithful adherent, society a cultured gentleman, and his family a devoted husband, father and homemaker.

James Grassick, M. D.

Proceedings of the Minneapolis Clinical Club

December 14, 1933

President, H. Bright Dornblaser, in the chair.

THE PATHOLOGY OF PULMONARY EMBOLISM

J. S. McCartney, M. D.

ABSTRACT

Pulmonary embolism, in the broad sense, includes all bodies which may act as emboli: blood clots, fat droplets, air, clumps of bacteria, and tumor cells, usually, however, massive embolism, due to large detached thrombi, is meant. Massive embolism is usually considered as a post-operative catastrophe but, in fact, is about as common when there has been no recent operation.

At times, at necropsy, the pathologist has difficulty in differentiating pulmonary embolism, thrombosis, and infarction. An embolus may become adherent to the wall of the pulmonary artery and then it may be difficult to tell whether the condition was primarily embolism or thrombosis. The presence of a source for an embolus may not be a deciding factor.

The textbook picture of signs and symptoms of pulmonary embolism is subject to many exceptions. The duration of life after embolism apparently depends largely on the size of the embolus, a large clot killing very quickly, a small clot or a number of small clots causing death more slowly. What percentage of pulmonary emboli result in death is unknown.

In recent years the problem of thrombosis and embolism has been attacked from any different standpoints, but still many things are very imperfectly understood. Various changes in the blood have been described. Opening of the peritoneal cavity seems to be a very important etiological factor. Age is very important.

A review of the postmortem records in the department of pathology reveals an incidence of pulmonary embolism in 2.65 percent. The source of the embolus was found in only about 65 percent of cases. Heart lesions appear to be a very important factor in the causation of pulmonary embolism. In this series the effect of age is clearly demonstrated. Embolism is much more common in persons who have had Laparotomies than in those who have had operations in other parts of the body. Embolism occurs more commonly after simple than after compound fractures, and with fractures of the lower extremities more frequently than with fractures elsewhere.

PULMONARY EMBOLISM IN OBSTETRICS

C. J. Ehrenberg, M.D.

This subject of pulmonary embolism is difficult to discuss because the condition is so rare that no person sees many cases, and for this same reason the reports of cases in the literature are variable and incomplete. My own experience has been limited to three cases of pulmonary embolus in obstetrics.

The first case occurred almost immediately after labor. There was circulatory collapse, cyanosis, pulse irregularity and dyspnea. A clinical diagnosis of pulmonary embolism was made. The patient recovered in about two hours. Subsequently a lung infarct could not be demonstrated by x-ray.

The second case was one of a patient in her first pregnancy who, at term, developed a localized thrombo-phlebitis in her right calf. The usual treatment of leg elevation and heat was instituted and that night the patient went into labor. She delivered uneventfully and on the next morning was found with a well developed phlebitis in the right saphenous vein. On the seventh day I received a telephone call from the hospital telling me that the patient had collapsed and was coughing blood. On arriving there shortly after, I found the patient extremely pale with a circulatory col-

lapse, pulse being very rapid and iregular and the systolic blood pressure down to 60. A cursory examination showed dullness in the right lower chest with no breath sounds coming through.

A medical consultation was had immediately and there was some difficulty in differentiating the diagnosis from heart disease. The acute symptoms subsided within twenty-four hours and a diagnosis of "pulmonary embolism with lung infarct" was established. Fortunately, the patient recovered and subsequently developed a left thrombo-phlebitis which subsided only after a number of months.

The third case was a patient who had had her second child uneventfully. She was dismissed from the hospital on the tenth day and while getting into the car to go home, had a sudden seizure of sharp pain in the chest. There was an immediate circulatory collapse, dyspnea and a high grade of cyanosis. After resting in the car for an hour with partial circulatory recovery, she was taken back into the hospital and in two hours she had another collapse which lasted an hour. Twelve hours later there was a third collapse which lasted two hours. Here, again, difficulty was had in arriving at a definite diagnosis inasmuch as the picture was confused by the circulatory disturbance and suggested a possible heart condition. However, electro-cardiagrams at this time were entirely normal. The next day the patient had considerable pain in the lower left costal region and a few days later a fan-shaped infarct in the lower lobe of the left lung with the base toward the diaphragm was demonstrated with x-ray. The patient recovered from the embolism, developed a thrombo-phlebitis in her left leg and about the time this subsided she developed a thrombo-phlebitis in the right leg, entire recovery taking place in three months.

Of these three cases, the last two were positively pulmonary emboli and the first mentioned was questionable. At the time of the third case I had occasion to make considerable review of the literature and found very little suggesting definite conclusions. I think Dr. McCartney's paper has covered many points and that his statistics are the best I have heard or read.

Many writers consider the pathology of embolus essentially the same as the pathology of thrombosis even though embolus occurs, many times, without the presence of demonstrable thrombo-phlebitis.

In obstetrics, I believe there are three things we must know more about before we can come to any conclusion regarding pulmonary embolus. The first is a more complete knowledge of the vascular changes in the pelvis during pregnancy and puerperium. Since 1850 there has been considerable work done on this subject but it is very inconclusive and controversial. There is one thing, however, on which many of the writers agree and that is that the circulatory changes which do take place, have occured late in pregnancy and are then extended into the puerperium. Dr. J. W. Williams, who died in 1931, after publishing an essay on the changes at the placental site during puerperium, made a complete review of this subject and wrote: "The greatest confusion still exists concerning the character and origin of the vascular changes which occur during pregnancy and puerperium."

The second thing about which more should be known is in regard to the mechanism of blood clotting at this time. Extra vascular clotting of the blood is well understood but what takes place intravascularly at the time of thrombosis, no one knows, and to my knowledge no experimental work has been done on this subject.

The third thing is more careful reporting of cases and more careful tabulation of the statistics on this subject. The literature contains many tables but the case records are so incomplete that the tables are of little value. .

The literature reveals two opposing theories as to the origin of thrombosis and embolism. On one side the writers believe in a traumatic and mechanical origin and base their theory on the facts that thrombo-phlebitis is more frequent in abdominal surgery, that the left leg is involved the most frequently, that there has been no improvement in incidence with the development of better technique, that patients with an afebrile course and with perfect wound healing have emboli and thrombi and that the thrombi and emboli are sterile as they do not suppurate. On the other side are the advocates of an infectious theory. They point out that no wound is sterile, that there is no suppuration because the blood in itself is bactericidal, that the toxins from the bacteria may be causative even with a subfebrile course, and that there have been a number of cases of thrombo-phlebitis in pneumonia and typhoid fever. To me these theories are purely academic and I am willing to believe that factor included in both are causative.

I have collected a number of statistics which may be of interest. The first group was compiled by Schenk in 1913. He collected 96,000 obstetrical cases with an incidence of 381 femoral thrombosis, aproximately one in 250 cases. This does not include cases of probable pelvic thrombosis but only demonstrable thrombosis in the femoral

veins. In this same group of obstetrical cases there were 44 fatal pulmonary emboli, approximately one in 2500. However, he did not mention whether or not these fatal cases were proven by postmortem examinations.

In 49,161 gynecological cases there were 566 cases of femoral thrombosis which is an incidence of one in eighty-seven but if only laparotomies were considered, the incidence was one in forty-four. Operations on myomatous uteri were particularly high; femoral thrombosis incidence being three per cent in 3,204 cases.

He also reports Wertheim's figures of an incidence of 2.9 per cent of femoral thrombosis in myomatous uteri operations through the abdomen and only .9 per cent in the same condition operated vaginally.

The second group of figures are those of Bunzel which were compiled in 1927. He collected 31,716 consecutive obstetrical cases from Sloan's, Women's and New York Lying-in-Hospitals with 32 cases of embolus. He dealt with embolus throughout the entire course of pregnancy. Of the 32 cases, 6 of them followed operative procedures early in pregnancy, all laparotomies. One, an ectopic pregnancy, three abdominal hysterotomies, one a hydatiform mole and one a dermoid cyst. I would consider these six cases as purely surgical and non-inclusive in obstetrical figures.

He reported one case of a decompensated cardiac condition that had a pulmonary embolus at four months with recovery and later went through labor and puerperium uneventfully. There was also one case of a decompensated cardiac condition that had a fatal pulmonry embolism before going into labor.

This leaves 24 cases of pulmonary embolism in 31,708 consecutive obstetrical cases or an incidence of one in 1350. Of these, 65 per cent were fatal or an incidence of one in 1850 consecutive obstetrical cases as compared to the figures shown by Schenk which was one in 2500. This will show the rarity of the condition obstetrically.

Bunzel draws some interesting conclusions from the statistics which he gives. First, as to the onset of the embolus. It was immediate in six cases, in the first 24 hours in two cases, from the third to the ninth day in seven cases, from the ninth to the twentieth day in seven cases and after the twentieth day in two cases, showing that the majority came sometime between the third and the twentieth day. He also noted that in caesarian section the incidence was about twice as high as in normal labor; and in placenta previa, in which, in every case, the bag technique was used, the incidence was about three times as high as in normal labor. In other words, where the incidence of embolism in obstetrics was about .07 per cent it was .15 per cent in caesarian section and .2 per cent in placenta previa. Second, as to fatality; of the fatal cases 70 per cent died within the first hour and 90 per cent died within the first twenty-four hours. So that if a patient survives an embolism one hour the chances are seven out of ten to live, and if a patient survives the first twenty-four hours the chances are nine out of ten to live.

The last group of statistics I have were compiled by an Englishman, Beattie. He reported three cases of pulmonary embolism in 3500 consecutive cases, none of which were fatal. He collected 251,000 obstetrical cases with an incidence of pulmonary embolus in one out of 1650.

If conclusions may be drawn from these three sets of figures, about one in 250 cases of obstetricsc have a femoral thrombosis, about one in 1600 cases has an embolism and about one out of 1850 to 2500 has a fatal pulmonary embolism. With the incidence being increased in caesarian section and placenta previa. In gynecology the incidence is apparently much higher, being about three times as often as in obstetrical cases and occuring about five and one-half times as often when laparotomies have been done.

In discussing pulmonary embolism, air embolus must be mentioned because it has been demonstrated that such a condition is possible and particularly in obstetrics. In 1924, Gough reviewed this subject and mentioned four cases he collected from the literature in which an embolus occurred at the time of delivery. In each case the embolus occurred at the same point in the delivery which was a version, being done for placenta previa. In each case the embolus occurred while the foot was being withdrawn.

Blair and McGuigan have shown experimentally, that various amounts of air can be put into the venous circulation with recovery of the animal. However, with each injection, regardless of the amount of air, there was an immediate fall in blood pressure, there was dyspnea, restlessness and a fluttering of the pulse. In their conclusions they state that when death occurs the respirations stop first and the heart continues to beat for some time afterward. They recommend that in suspected air embolus the heart be auscultated for a bubbling noise and if present, withdrawal of the air from the heart with a syringe and needle. They further recommend artificial respiration and the use of intravenous solutions.

Nordland, in 1927, worked on air embolism in dogs. He was interested in air embolism in re-

lation to thyroid surgery. He used dogs thyroidized with thyroxin and found that enormous quantities, up to 100 c.c. of air, could be injected into the jugular vein of the dog without death. Following injection he observed the same symptoms that were mentioned by Blair and McGuigan. He further demonstrated that with increasing toxicity, diminishing amounts of air in the injections produced death.

PULMONARY EMBOLISM IN SURGERY

J. M. Hayes, M.D.

Pulmonary embolism is a matter of great concern to the surgeon. The most disconcerting thing about it is just about the time the patient has apparently passed the danger point of a post-surgical condition, this strikes him like a bolt out of a clear sky and may prove fatal at once or render him in extremis.

As Dr. McCartney has said, many of these patients perhaps have had a pre-operative cardiovascular condition which had not been detected.

Not only have research workers been unable to produce pulmonary emboli experimentally but its occurence is so uncertain and irregular that the real cause and prophylaxis are difficult to ascertain.

I have been much interested in the extensive clinical work Dr. Walters has carried out over a long period of time with prophylactic treatment in view. Over a period of four and one-half years, he studied 4500 post-operative surgical cases and he concluded the following factors were important in the incidence of pulmonary emboli:

1. Lessening of the metabolic activity of the body.
2. Decrease in blood flow.
3. Lessening in blood platelets and other cellular elements.

The causes of these conditions were probably the following:

1. Rest in bed.
2. Interference with circulation by intra-abdominal manipulation.
3. Intestinal quiet, usually present after an abdominal operation.

From the above statements, increase in metabolic activity, increase in blood flow and cellular elements of the blood, and increased activity of the entire body should tend to lessen the incidence of pulmonary embolism. It has been demonstrated that thyroid extract administration would increase the metabolic activity.

Plummer had pointed out that hyperthyroid patients even though they had a severe cardiovascular condition, had a low incidence of pulmonary embolism, while in others with cardiovascular pathology the incidence was high.

Experiments have shown that with the administration of thyroid extract, the clotting of blood could be delayed to 25 or 30 minutes, while in the control animals the blood clotted in from four to ten minutes.

Frund had also shown the incidence of pulmonary embolism could be reduced by the administration of thyroid extract pre-operatively. In this series of cases reported by Walters there was a very low incidence of pulmonary emboli. In no case in his series did a pulmonary embolus occur where some cardiovascular condition was not detected before operation.

In his series pulmonary embolus was diagnosed at autopsy in four cases. One died of general septicemia, one died of uremia, and one had a definite fibrillation some time before operation. The incidence of fatal pulmonary embolism in this series was 0.09 per cent.

In another series of over 60,000 surgical patients studied at the clinic, Henderson found the incidence of fatal pulmonary embolism to be 0.34 per cent. In his prophylactic treatment Walters administered two grains of thyroid extract, t.i.d., begining about the second to the fourth day post-operatively. About 10 per cent of his cases did not get thyroid on account of contraindications. The patients were encouraged to move the arms and legs and turn from side to side.

In general, it had been estimated that there are from one to three pulmonary emboli in every 1,000 surgical cases. Recently, many surgeons, especially foreigners, have reported an increasing incidence of pulmonary embolism. Whether this is due to the fact that the scope of surgery has been widened in cases of greater risk or that the span of life has been increased, we are not sure.

In Schmieden's and also in Rost's and Bier's Clinics between 1923 and 1926, they claim that their incidence of pulmonary embolism increased three fold over the former periods of similar length. It also increased in their non-surgical cases but not so rapidly as in the surgical.

Schmieden's Clinic reported 30,000 surgical cases with an incidence of pulmonary embolism of 0.22 per cent in surgical cases, between 1917 and 1928, and 0.1 per cent in non-surgical cases. It is generally considered that pulmonary emboli occur on the average of from the sixth to the tenth day post-operatively. The great majority ocur between the ages of 50 and 70 years.

The subject has been studied quite thoroughly

from the standpoint of the anesthetic used, but this does not seem to be an important factor. There is much difference of opinion as to the importance of infection. Some believe it to be unimportant, while others believe it to be of prime importance. I am convinced that infection is an important factor.

Since we began the sclerosing of varicose veins by injection of various solutions about 10 years ago, I have been much interested in the very slight incidence of pulmonary emboli in this work in comparison with the incidence of pulmonary embolism in the presence of thrombi in the deep vessels. Varicose veins, as you know, are nonfunctioning veins, and consequently do not have the pressure of the blood stream against the clot to produce emboli. Here we produce a chemical thrombus which is firmly attached to the intima of the vessel. When we began this work we were quite convinced that the thrombus in the deep vessel was caused by infection and later broken down by infection to give off emboli. However, we have no definite evidence to prove this assumption. It has been estimated that about 70 per cent of all fatal pulmonary emboli follow abdominal and pelvic surgery. Surgery of the stomach and especially cancer of the stomach gives a very high percentage of fatal pulmonary emboli. Pelvic operations and especially those of the fibroid uterus, prostate, and bladder give a high percentage. Operations on the gallbladder, hernia, appendix and intestine come in for a fairly high percentage. In sugery of the extremities the incidence of pulmonary embolism is very low. Recent traumatic conditions increase the incidence of pulmonary emboli to some degree. I have seen a pulmonary embolus following a simple repair of a fractured patella, also a dislocation of the knee joint.

In the Koenig Clinic it was reported that only one-fourth of these cases were reported to have had a cardiovascular pathology before operation, while at autopsy 95 per cent showed some pathology that had been previously overlooked.

After reviewing the opinions of all those interested in this work we invariably come to the conclusion that little is yet known of the chemistry or mechanism of blood coagulation.

As to the surgery of pulmonary embolism, we are much in doubt. Dr. Cottam has given the subject considerable study and we are pleased to have him here to discuss this phase. So far, we may say, it is an interesting experiment.

In Sweden the attempt at removal of pulmonary emboli has been developed to a high degree. Einer Key has developed a very efficient technique and has had some recoveries after surgical removal. There have been occasional successful ventures in surgical removal of these emboli by other men.

They tell us they select those whom they think would otherwise have died. I have seen five cases recover whom I was quite sure would die. These cases I perhaps would have selected for surgery if I were to attempt this operation, and no doubt, many if not all would have died.

However, I have great respect for the man who has the temerity to not only attempt this great feat but successfully carry it out. It has been done successfully by several surgeons and perhaps in time many more lives may be saved by this surgical procedure.

Discussion

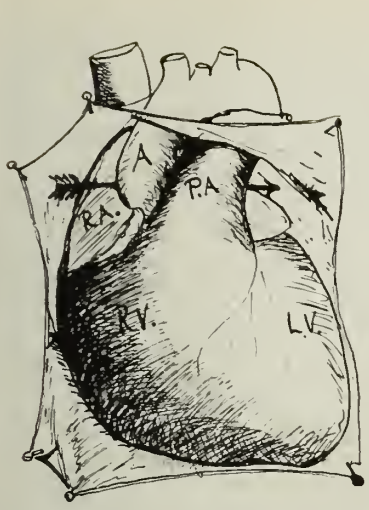
Dr. Gilbert Cottam (by invitation): In as few words as possible I will try to give you some idea of what has been done in the way of attempted surgical relief in this condition. Trendelenburg took the first step in 1907, having observed that of those dying from massive occlusive pulmonary embolism about 50 per cent did not die immediately but lived long enough to permit of operative intervention. He and his assistants, Sievers and Laewen, they, oftener than he, performed twelve operations up to January 31, 1912. Of these, ten died during the operation and two lived 15 and 37 hours respectively. The first successful operation was done by Kirschner in 1924 and since then eight more have been reported by other surgeons. The following table gives the names and references (Figure 1) and two more recent cases by A. W. Meyer should be added.

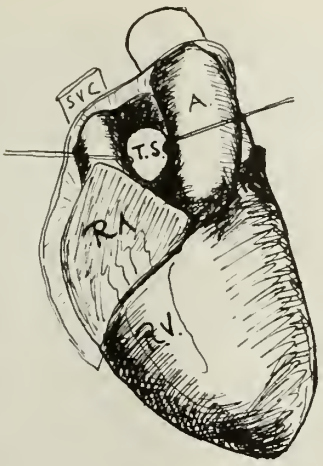
FIGURE 1

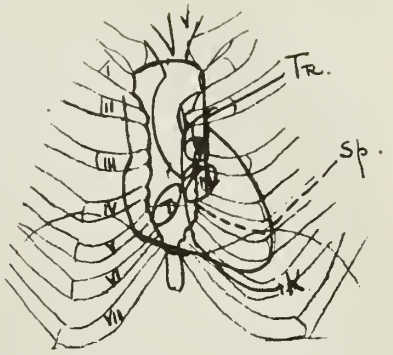
PULMONARY EMBOLECTOMY—RECOVERIES (7)

Surgeon	*Year*	*Age*	*Sex*	*Authority*
Kirschner, M. (Konigsburg)	...1924	38	F.	Arch. f. Klin. Chir., V. 133, pp. 312-359, April, 1924.
Meyer, A. W. (Charlottenburg)	...1927	54	F.	Proc. Staff Meetings, Mayo Clin., V. 4, No. 35, pp. 258-260, 1929.
Crafoord, C. (Stockholm)	1927	54	F.	Acta Scand. Chir., V. 64, pp. 172-186, 1928.
Crafoord, C.	1927	52	F.	Ibid.
Nystrom, G. (Uppsala)	1928	35	M.	Ann. Surg., XCII, pp. 498-528, October, 1930.
Meyer, A. W.	...1928	60	F.	Loc. cit.
Nystrom, G.	1929	46	F.	Loc. cit.

Besides these, I have a list of nine cases which survived the operation for periods of from three hours to 25 days and then succumbed, generally to new embolus formations, for there seems to be a tendecny to recurrence after the original clot has been removed. These operations, like the successful ones were all done in Sweden and Germany, where most of the fundamental research work, including the development of the technique, has been done. Nystrom, of Uppsala, who has contributed much to our knowledge of the subject







and has been responsible for two of the successful cases recorded, thinks that the operation should be reserved for the obviously dying, in view of the possibility of recovery in doubtful cases. An anesthetic is rarely needed. The incision, preferably of the Spangaro type, extending from the second costal cartilage downward on the left side of the sternum to the fourth interspace and outward, is quickly made and the second, third and fourth costal cartilages divided close to the sternum (Figure 2). This chest-wall flap is retracted upward and outwardly, without opening the pleura, giving immediate access to the pericardium, which is opened freely, longitudinally. A bent, flexible uterine sound is then passed through the lateral sinus (Figure 3), the end of a piece of rubber tubing slipped over its tip and the sound then withdrawn, leaving the tubing in situ to be used as a tractor. With its aid the pulmonary artery with its fused aorta is drawn forward into the incision, the stem of the pulmonary artery opened in its long axis and the embolus extracted with curved forceps. The edges of the opening into the artery are spread and everted with a special spring forceps shaped like a tissue forceps with one reversed tooth on each blade to enable the appliaction of a curved clamp guarded with rubber or gauze for the purpose of holding the slit closed while it is being sutured without impeding the flow of circulation which, up to this point, has been completely occluded in both the aorta and the pulmonary artery by the tension of the rubber tube. The entire period of time in which the circulation is thus cut off by the rubber must not, according to Trendelenburg, exceed 45 seconds. Trendelenburg devised several special instruments to expedite the performance of this operation. He had a special carrier for the rubber tube, a clamp, a clot extraction forceps and the spring forceps already described, the last named is the only special instrument really needed, indeed, in great emergency, without opportunity to pick out instruments, practically everything can be done with a knife, a few hemostats and needles, etc., for suturing. The transverse sinus readily admits the index finger and middle finger; with them the great vessels can be brought forward and the circulation in the pulmonary artery controlled by the thumb of the same (left) hand.

The question then pertinently comes up as to how practical this operation is for us in this country. Admittedly we stand in some disadvantage as compared, for example, to Sweden. There the nursing and resident physician personnel of the hospitals is much more permanent than ours and these people are trained to watch for and recognize the earliest symptoms of pulmonary embolism. Surgeons like Nystrom and Westerborn often live on the grounds of the hospital. Instruments and operating rooms are kept in readiness and mechanical contrivances for trasferring of patients, bed and all, to the operating room quickly and without disturbance, are at hand.

Rudolph Matas, for whose surgical wisdom and judgment we must all have the most profound respect, feels that the operation is now fully standardized and that we should accept it and prepare for it just like any other emergency measure. The question will be more easily answered, I feel, when we reach the point when we can definitely say that a given patient will die if the operation is not done, or that a given patient will get well if let alone. It has been done a few times, unsuccessfully, in the United States, and in various parts of the country surgeons are alive to the possibilities of the operation and are prepared to meet it. As Matas says, it is going through the same process of doubt and uncertainty that all great

pioneer advances in surgery have experienced before being fully accepted and systematically used. After it has been done with success and in cases of unquestioned need, in a few instances, the whole matter will rest on a firmer basis.

Dr. Roy Swanson: I do not believe I heard essayists speak about hyperventilation. Hyperventilation has been used much of late in preventing pulmonary complications postoperative.

Dr. O. J. Campbell: I should like to ask whether or not the speakers have any figures showing the percentage of fatal cases of pulmonary embolism in which the clinical signs of thrombo-phlebitis were present. All cases of pulmonary embolism which I have observed have been those in which we had no suspicion of venous thrombosis. As a consequence, I have always felt rather secure in cases of thrombo-phlebitis which could be diagnosed clinically, believing that the clot is firmly enough attached as to be not easily displaced.

I had an experience with pulmonary embolism in which the patient, himself a surgeon, was able to describe accurately his sensations. This man had a series of sublethal emboli and showed the most marked improvement, both subjectively and objectively, on large doses of morphine.

Dr. Judd once made the statement that large doses of morphine were sometimes life saving and the only practical measure available in pulmonary embolism.

Dr. R. C. Webb: We have at this time a patient with a comminuted fracture of the tibia and fibula involving the ankle joint who has just had a pulmonary embolus a few days ago. Although I appreciate the frequent association of pulmonary emboli with fractures and have been looking for one for several years, this is my first personal case. This man was injured November 30th at a considerable distance from Minneapolis. Novocaine was injected into the site of the fracture and this was followed by manipulation and the application of a plaster cast which ended just below the knee and was rather tight. When he arrived in Minneapolis the cast was removed and a Kirschner wire traction was applied through the os calcis. Eight days after injury he suddenly complained of pain in the lower right chest, dyspnoea, and the next morning a friction rub, bloody sputum and signs of consolidation were demonstrated. There was a sharp rise in temperature, pulse and respiration, which promptly subsided and an X-ray of the chest showed a condition which was described as either a pulmonary embolism or a pneumonia.

I am wondering if it would not be well in hospitals where oxygen tents are available, to permit the nurses to start oxygen treatment at once on patients where embolism of his type is suspected. It might be that with such permission they would observe these cases with keener interest and might save a life occasionally and even avoid the more serious procedure of embolectomy.

Dr. C. A. McKinley: With regard to the prevention of pulmonary thrombosis and embolism by the use of thyroid extract, I would like to ask if any of the surgeons have used the new drug, dinitro-phenol. It has a similar effect to thyroid extract in raising metabolism. The only advantage that might accrue is that it is more rapid in its action; it has the disadvantage of being distinctly toxic in certain cases.

Dr. R. Swanson: What did Dr. Wynne find in his study on ectopic pregnancies at Johns Hopkins?

Dr. H. M. N. Wynne: There were 13 deaths from all causes in the series of 303 cases. One death occurred two and one-half hours following operation, the patient having been in good condition until a few minutes before exodus. This death was presumed to be due to a pulmonary embolus but no autopsy was permitted.

I wish to ask Dr. McCartney if, in his series, following gynecological operations, there were a sufficient number to note any difference in the percentage of pulmonary emboli after myomectomy as compared with those in whom hysterectomy had been performed. It has been stated in the past that there is a higher percentage of pulmonary emboli following myomectomy than there is following hysterectomy.

I have seen a number of cases of fatal pulmonary emboli and two of my own occurred after salpingectomies.

Dr. J. S. McCartney: Dr. Campbell has raised the question regarding the incidence of thrombo-phlebitis. In the 72 postoperative embolisms there were two cases which had a clinical thrombo-phlebitis. I might also add, in this connection, there were two other cases which followed the injection treatment of varicose veins and one additional case following the surgical removal of varicose veins. I do not know whether or not these should be included as cases of clinical thrombosis. If so, there were five out of 72.

I think there is an explanation why there is no clinical thrombo-phlebitis in the cases where there is a fatal embolism. In the case where you have a clinical thrombo-phlebitis with its attendant edema and tenderness in the vein, to get severe edema you practically have to have a thrombus which occludes the venous circulation for a certain extent. I think that you do not have it in the

cases of embolism because the thrombus is attached over a small area and does not occlude the lumen of the vein. The blood current is always flowing past the projecting thrombus while, with occluding thrombus the stream is not passing and the thrombus is not readily dislodged.

As to the question of the location or the primary site of the thrombosis, it is usually stated that the left leg and femoral veins are the common sites. There are two anatomical explanations given for this. One is that the right common iliac artery crosses over and compresses the left common iliac vein and hence, there is stasis below the level of compression.

The other idea is that a full rectum presses on those vessels and infection extends directly from the rectum to the veins of the pelvis. Ordinarily, in these cases, where there is a fatal embolism, there is no wound infection as far as can be seen with the naked eye. The anatomical explanation seems to me to be a better one.

In the cases of fractures, ordinarily the primary thrombosis is not in the above location but tends to be in the region of the fracture where there has been a trauma of the soft tissues and trauma of the vessels. You might find that the thrombus has extended up into the femoral and iliac vessels but if the dissection is carried far enough you will find there is also thrombosis in the region of the fracture or bruise. Ordinarily, embolism occurs with the simple fractures and not with the compound fractures.

I cannot answer Dr. Wynne's question off hand. I have not grouped the cases from that standpoint.

Dr. Gilbert Cottam: In mentioning the age incidence, did you say you had one case in the first decade? How old was that patient?

Dr. J. S. McCartney: One and one-half years old.

In one obstetrical case the embolism took place five and one-half hours after delivery which means that there must have been thrombosis prior to the labor.

Dr. Hayes has indicated the time when the embolism ordinarily takes place in post-operative cases as somewhere around the end of the first week or beginning of the second. It apparently takes place sometime later in the traumatic cases —toward the end of the second or third week. Sometimes it is delayed for a good many weeks, even to two or three months.

I had one case following injection of varicose veins. This patient had had injections five and ten days prior to her embolism; she was not confined to bed but was walking at the time the embolism occurred.

Dr. J. M. Hayes: Dr. Ehrenberg mentioned hyperventilation as a prophylactic procedure in pulmonary embolism. I am pleased to note that most of the hospitals in Minneapolis are now using this routinely, and I think should be an important factor in the prophylaxis of this condition. I also agree with Dr. Webb in the use of carbon dioxide and gas for the treatment of this condition.

The condition is so irregular and uncertain that we are not quite sure that any treatment does any good after it once appears.

Dr. McCartney has mentioned the occurence of two fatal pulmonary emboli following the injection of varicose veins. In the past ten years we have had well over 40,000 injections of varicose veins and I have yet to see a single patient with any symptoms of pulmonary embolism.

Dr. C. J. Ehrenberg: In regard to the surgical treatment of embolism, it strikes me that it would take unlimited nerve to attempt an operation of this magnitude. The patients I mentioned early in my discussion were very sick and looked as if death were eminent at any moment. Any surgeon who would have suggested operation to me at the time would have had a battle on his hands. Further, if the figures I quoted from Bunzel are of any value, if a patient survives the first hour the chances are seven out of ten of living and certainly the results reported in the surgical procedure on pulmonary embolism are much worse than this.

Also, in mentioning surgery, there was, about twenty years ago, a considerable controversy among the gynecologists as to whether or not ligation was the treatment of femoral thrombosis. Many of the operators of this period attempted the operation but with so little success that the procedure has been dropped entirely.

Dr. Webb asked the question in regard to the use of the oxygen tent. In one of the cases I mentioned, the oxygen tent was used immediately with a marked improvement as far as the cyanosis was concerned. A few weeks ago there was a paper in the Journal of the American Medical Association concerning the use of carbon dioxide and oxygen mixture in obstetrics. This paper reported these gases as a circulatory stimulant and a uterine stimulant, and should be of value in pulmonary embolus.

J. K. Anderson, M.D.,
Secretary.

TUBERCULOSIS OF THE CONJUNCTIVA

(*Continued from Page 83.*)

sutured. Possibly there was some spasm of the orbicularis to aid in approximating the two edges where fully five mm. of skin and tarsus had been removed, but no such spasm could be seen on examination. At this time, two minute granulations still remained on the lower lid. These were lightly cauterized. The right eye was ordered treated by ultra violet light in the same way, and one granulation was cauterized on the lower lid, also. Since the patient lived some distance from here, I wrote her local doctor to kindly continue the light treatment twice weekly for three weeks. This he did, and on May 20 the patient returned with apparently normal looking eyes except for an inconspicuous linear scar five mm. long extending down from the external canthus of the left eye.

I have reported this case because of the rarity of this condition, its quick response to local light therapy applied to the closed eye, and the apparent further evidence that ultra violet light produces a local tissue reaction much deeper than the actual penetration of the rays, themselves.

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NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. T. C. Kelly, Mankato, Minn., has again resumed active practice after being ill for over two years.

Dr. Hugo H. Blair, a graduate of tht Harvard Medical School, has become a member of the Mayo Clinic at Rochester.

Watertown, S. D. are in hopes that they will be able to raise money sufficent to construct a modern hospital in that city during the present year.

Dr. George E. Sherwood, was elected the president of the Stearns-Benton Medical Association, at the annual meeting held at Kimball, Minn., last month.

Dr. Thor. Moeller, who has been in active practice at Chicago for several years, is now located at Bisbee, N. D., where he has opened offices for general practice.

Dr. E. S. Fugelso, who was recently married to Miss Fanny Gardner of Omaha, will locate at Mystle, S. D., where he has opened officies for general practice.

Dr. G. M. Williamson, Grand Forks, N. D., was in Chicago this month, when he attended the annual meeting of the Federation of State Medical Boards of the U. S.

Dr. J. C. Litzenberg, Minneapolis, wes recently married to Dr. Olga S. Hansen, of St. Paul, and are spending the next few weeks traveling in the southern cities.

Stanton, N. D., is sadly in need of a good physician to locate in that growing progressive town. You can write the JOURNAL-LANCET for further information.

Dr. Fred N. Hunt, Fairmont, Minn., one of the pioneer physicians in that section of the state, died recently at the age of 77 years. A bad fall was the cause of his death.

Dr. R. P. Frink, Wagner, S. D., has been appointed official physician for the Indians at the Greenwood agency. Dr. Frink has been in active practice at Wagner for over 30 years.

Dr. Dean Lewis, president of the American Medical Association, and professor of surgery at the Johns Hopkins Medical School at Baltimore, was a visitor in the Twin Cities this month.

Dr. A. W. Ide, St. Paul, and Dr. I. F. Hawkinson, Brainard, were the guest speakers at the January meeting of the members of the Todd County Medical Society, held at Staples, Minn.

Dr. J. G. Norby, superintendent of Fairview Hospital, Minneapolis, was the guest speaker at a public meeting at Madison, Minn., his subject being, "The Hospital as a Community Asset."

The $10,000 malpractice suit against Dr. E. A. Pray, Valley City, N. D., was quickly dismissed by the jury. The doctor had been charged with failing to properly treat a fractured leg.

On Thursday, March 1st, the Minneapolis Surgical Society will hold its regular meeting at the Minneapolis General Hospital. This meeting will be largely devoted "To Fractures"

and the meeting is open to the profession.

Laurel, Montana, have recently opened a new hospital, equipped throughout with every modern convenience. The building is located on the Yellowstone river, making it one of the finest hospitals of its kind in that state.

The Freeborn County Medical Society held their annual meeting at Albert Lea, Minn., and elected the following officers: Dr. S. D. Burns, president; Dr. F. G. Folken, vice-president, and Dr. W. P. Freligh, secretary.

The annual meeting of the Musselshell County Medical Society was held at Roundup, Mont., last month. They elected the following officers: Dr. G. A. Lewis, president; Dr. S. A. Crouse, vice-president, and Dr. C. T. Pigot, secretary.

Dr. Cyrus B. Eby, who had been in active practice for over 30 years at Spring Valley, Minn., died suddenly on January 22nd, while visiting one of his rural patients. Dr. Eby was 62 years of age and a graduate of the University of Minnesota in 1892.

At the regular meeting of the members of the Minnesota Academy of Medicine held this month, the following papers were presented: "Disseminate Lupus Erythematosus," Dr. Paul A. O'Leary, Rochester; "Sinusitis and Asthma," Dr. Charles E. Connor, St. Paul.

Physicians from seven cities attended a meeting in Chicago recently to discuss "the problem of amotbic dysentery as it affects the entire country." Doctors invited from Minnesota included Dr. Thomas B. Magath, Rochester, and Dr. A. J. Chesley, St. Paul.

Duluth physicians and surgeons tendered a testimonial dinner in honor of Dr. Elmer C. Bartels who is returning to Ohio after practicing in that city for two years. He was associated with Dr. A. E. Olson. Dr. R. J. Moe presided at the dinner. Fifty-five doctors attended.

Dr. W. A. Fansler, Minneapolis, recently attended the Linn County Medical Society meeting in Cedar Rapids, Iowa. He held an operative clinic in the afternoon and at a dinner meeting in the evening, read a paper on "The Physician's Responsibility in Rectum Carcinoma."

The annual meeting of the Sioux Valley Eye and Ear Academy was held at Sioux City, Iowa, January 24th. The list of new officers are: Dr. J. J. Hompes, Lincoln, Neb., president; Dr. J. A. Hohf, Yankton, S. D., vice-president, and Dr. Jay C. Decker, Sioux City, Iowa, secretary.

The January meeting of the Stutsman County Medical Society brought out a large attendance of members at Jamestown, N. D. Two guest visitors were present from the Mayo Clinic. Dr. R. K. Dixon, read a paper on "Cancer of the Colon" and Dr. F. A. Willius, subject was "The Heart in Obesity."

The Upper Mississippi Medical Society convened at Brainard, Minn., and elected the following officers for 1934. Dr. R. A. Beise, Brainard, president; Dr. S. Z. Kerlan, Aitkin, first vice-president; Dr. A. M. Watson, Royalton, second vice-president; Dr. L. T. Davis, Wadena, third vice-president, and Dr. G. I. Badeaux, Brainard, secretary.

In the treatment of coryza Pulvules Copavin, Lilly, a combination of codeine and papaverine based upon the work of Dr. H. S. Diehl, of the University of Minnesota Medical Department, have proved very satisfactory. These pulvules (filled capsules) are supplied through the drug trade by Eli Lilly and Company under license from the University of Minnesota.

Dr. J. E. Engstad, one of the pioneer practicing physicians of Grand Forks, N. D., has been elected to membership in the American Medical Editors and Authors association. The association is one of the most exclusive in the country, and consists of medical men who have contributed to scientific magazines or written medical works. Membership is largely in the larger centers of population. Its headquarters is in New York.

Lectures by men distinguished in the study and practice of medicine are scheduled for a series of eight addresses at the University of Minnesota medical school during February, March and April. In the series will be six lectures sponsored by the Mayo Foundation. Dr. Melvin S. Henderson, February 20; Dr. William C. McCarty, March 6; Dr. William P. Moersch, March 20; Dr. Charles Sheard, April 3, and Dr. Hugh Cabot, April 17.

The annual meeting of the Sioux Valley Medical Society held at Sioux City, Iowa, last month, was one of the most interesting of any held for many years. The attendance being

much larger than had been expected, and with a very interesting program presented, made all of the sessions very enjoyable. All the papers presented will be published in latter issues of the JOURNAL-LANCET. The new officers elected are: Dr. E. L. Perkins, Sioux Falls, president; Dr. C. C. Tellesen, Wynot, Neb., first vice-president; Dr. Ludwig Sogge, Windom, Minn., second vice-president; Dr. Roscoe Jepson, Sioux City, secretary, and Dr. W. R. Brock, Sheldon, Iowa, treasurer.

A fracture course has been organized by the Kandiyohi-Swift-Meeker County, Minn., Medical Society, consisting of six Thursday evening dinner meetings, to be held at Willmar, Minn. Six Minneapolis surgeons have been invited to present the course. The dates, subjects and speaker are as follows: Dr. Arthur A. Zierold; February 15th, "Fractures of the Clavicle, Scapula, Ribs, Sternum and Dorsal Spine," Dr. Robert F. McGandy; February 22nd, "Fractures of the Upper Extremity," Dr. Richard R. Cranmer; March 8th, "Fractures of the Pelvis, Sacrum, Coccyx and Lumbar Spine," Dr. Edward A. Regnier; March 15th, "Fractures of the Femur and Patella," Dr. Roscoe C. Webb; March 22nd, "Fractures of the Tibia, Fibula, Ankle and Foot Bones," Dr. Willard D. White.

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Vol. LIV, No. 5

Premature Detachment of the Placenta

Frederick H. Falls, M.D.*
Chicago, Ill.

PREMATURE detachment of the normally implanted placenta may be one of the most serious complications of pregnancy and labor. The dramatic suddenness with which it may occur, the baffling symptoms that develop without apparent reason, the tragic death of the fetus in most cases and of the mother in about fifty per cent of cases, combine to make of this condition a complication of pregnancy which demands our serious consideration for its detection and treatment.

Little is known about the etiology of this condition in spite of a considerable amount of research on the problem. The older writers stressed trauma as a factor, such as a fall or blow on the abdomen, while some few cases give such a history, the great majority have no such antecedent history.

Williams and others have found certain evidence of degeneration in the media of the arteries of the decidua. He felt that small hemorrhages, due to these changes, resulted in decidual hematomata, which, as they increased in size, caused detachment, partial or complete, of the placenta from the uterine wall. These patients nearly always present evidence of a toxemia, which may be the underlying cause of the arterial changes.

Certain predisposing factors may be mentioned. Multiparae are more commonly affected than primipara. Thus Cragin found in 212 cases, 139 were in multiparae and only 73 primiparae.

Certain constitutional diseases, such as syphilis, smallpox or scarlet fever, may promote the possibility of decidual hemorrhage.

Uterine over distention due to hydramnios or multiple pregnancy may increase the likelihood, especially after the rupture of the membranes or the birth of the first of twin babies.

A short cord or one of normal length which becomes wrapped around the fetus may cause traction on the placenta during labor, resulting in its premature detachment. There are cases, however, that occur in the absence of any of these predisposing factors and whose etiology remains unexplained after the most careful investigation.

The pathological changes, due to premature separation of the normally implanted placenta, may be considered under local and general changes, and depend upon the stage of pregnancy and whether or not the separation is complete or incomplete, or whether concealed or apparent hemorrhage accompanies the separation. These cases may be divided into five groups.

GROUP I. Early in pregnancy the changes are limited to the decidual site. The placenta is peeled off of the uterine wall and is then expelled, together with some clots from the uterine cavity. The pathology does not differ grossly from other forms of abortion.

GROUP II. After the sixth or seventh month,

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if the separation is incomplete and not to extensive, the pregnancy may continue to term. When the placenta is expelled the only evidence of the condition will be a partially organized old blood clot with slight degenerative changes in the overlying placenta, and in the corresponding underlying decidua serotina. In some of these patients, however, the blood clot may irritate the uterine wall to such an extent that premature labor is initiated and the fetus expelled. In these cases a varying amount of apparent hemorrhage may be noticed.

Group III. If separation of the placenta is complete, the blood may dissect the membranes away from the uterine wall down to the cervical os and flow out into the vagina, i. e., apparent hemorrhage. There is relatively little damage to the uterine wall in these cases. There may be an associated severe secondary anemia, if the blood loss is extensive.

Group IV. Where there is complete separation of the placenta and the blood is retained in the uterine cavity (concealed hemorrhage), the most striking pathology occurs. Under these circumstances the uterine cavity is ballooned up by the blood and becomes enormously distended. This is associated with hemorrhages into the placental site, the so-called uteroplacental apoplexy of Courvelaire. The uterus is hard, deep purplish in color, and the peritoneal surface may show a coppery sheen. There may be tears in the peritoneal covering 2 to 5 c.m. long and extending half a centimeter into the uterine musculature. There is frequently considerable blood in the abdominal cavity, and large amounts of old blood clots in the uterine cavity. There is usually a very severeacute secondary anemia.

Group V. In rare cases we may have the pathology as just described in Group IV, plus a secondary expulsion of the blood clots before or after the fetus is born, when the uterus, instead of contracting down around the fetus, remains as a flabby muscular sack. The hemorrhage continues in these cases, leading to death of the patient unless the uterus is removed.

The recognition of the development of this pathology and the principles of treatment based on a thorough understanding of it, is the purpose of this paper.

Symptoms

The symptoms in Group I are indistinguishable from those of any ordinary abortion.

In Group II the symptoms simulate closely those of placenta previa. A flow of blood varying in amount from a spotting to severe hemorrhage may occur. Sometimes the blood is retained in the uterus. There usually is some crampy pain, which in some patients is quite severe. As a rule the fetal heart tones show only slight embarrassment. If, however, considerable separation has occurred they may become very rapid and weak, or may disappear entirely. Rarely is there evidence of anemia in these cases. Labor may or may not be brought on.

In Group III there is usually seen a severe ante partum hemorrhage with evidence of rapid severe anemia. The pulse is rapid, face pale; there is usually some abdominal pain and labor may be initiated. The fetal movements will cease and the fetal heart tones will disappear. Faintness, thirst, dizziness and spots before the eyes are complained of, and air hunger is evident.

Group IV. In this group the symptoms are most striking and most confusing to the general man. A patient who has been perfectly well, or at most has shown only mild symptoms of toxemia, suddenly is seized with severe abdominal pain, which becomes progressively worse. She becomes faint, often vomits, sees dark spots before her eyes, is dizzy and dyspneic. There is marked pallor, rapid pulse, thirst and restlessness.

On examining the abdomen the uterus is found extending higher than normal in the abdomen, and is of a board like consistency and exquisitely tender. The fetal heart tones or fetal movements cannot be heard, and the small parts of the fetus cannot be outlined. A blood count may be deceiving, because the degree of anemia does not become apparent until the fluid loss has been replaced. The blood pressure may fall very low, and all the symptoms of shock be present. Labor may set in, but the pains are usually weak and inefficient, due to the overstretching of the uterine muscle. Dilatation of the cervix may occur, and extrusion of the fetus with the placenta and blood clots. This is frequently followed by severe post partum hemorrhage, which may be uncontrollable by ordinary means.

Group V. The symptoms are a combination of groups three and four. The early symptoms are those of group four. After a varying length of time the membranes are dissected away from the uterine wall and a large amount of blood is expelled from the vagina. Under these circumstances the uterine consistency changes from hard to soft. The fetal outlines which previously could not be made out, become more apparent than usual, so much so that a diagnosis of rupture of the uterus with fetus free in the abdominal cavity has been made. Very severe shock

and hemorrhage symptoms usually are present in these cases, and post partum hemorrhage is greatly to be feared, due to the relaxed and paralyzed condition of the uterine musculature. In groups four and five there may be considerable hemorrhage into the abdominal cavity from the tears in the peritoneum and underlying uterine muscle, due to the over distention. These tears may continue to bleed even after the intra-uterine hemorrhage has been stopped.

Diagnosis

Group I. Cramp-like pains, associated with evidence of bleeding, concealed or apparent, in a pregnant woman, especially after the sixth month of gestation, should be considered a premature detachment of the placenta until proved otherwise. The direct diagnosis is difficult because the symptoms are practically the same as for any other type of abortion.

Group II. The diagnosis is usually easy when there are associated signs of uterine contractions, some pain, evidence of embarrassment of the fetal circulation, and when on inserting the finger tip through the cervix no placenta can be made out between the finger and the presenting part. Crampy pains are almost always associated.

Group III. The diagnosis depends on the severe hemorrhage, the evidence of fetal death, crampy pains and the absence of placental tissue noticed on palpation over the internal os.

Group IV. The diagnosis is made on the evidence of severe internal hemorrhage, as shown by pulse, pallor, air hunger, blood changes and on the lignious consistency of the uterus and evidence of fetal death, together with difficulty in outlining the fetus.

Group V. The findings are equivocal. There has been severe external bleeding. The clinical signs of hemorrhage are apparent. Instead of the uterus being hard and woody, it may not be outlinable at all, and the fetus may be felt so plainly through the uterine wall that the impression gained by examination is that it is free in the abdominal cavity, and that one has to do with a ruptured uterus. In these cases, in my experience, the most desperate condition of hemorrhage and shock exists.

The condition must be differentiated from various forms of ante partum hemorrhage.

Group I cannot be differentiated from abortion from other causes, and there would be no clinical advantage if it could.

Group II and III should be differentiated from placenta previa.

Premature Detachment	*Placenta Previa*
Hemorrhages tend not to recur.	Hemorrhage tends to recur.
Pains may be present.	Painless.
Baby may be embarrassed.	Baby normal.
Mother may show signs of toxemia.	No toxemia.
Finger in cervix feels no placenta.	Placenta felt vaginally.

These types should also be differentiated from carcinoma of the cervix uteri.

Premature Detachment	*Ca. of Cervix with Pregnancy*
Usually pains are present.	Painless.
Cervix feels normal.	Carcinoma palpable.
Baby embarrassed.	Baby not effected.
Usually later in pregnancy.	May occur anytime during pregnancy.
Signs of toxemia.	No evidence of toxemia.
Women of any age.	Older women the rule.

Group IV and V must be differentiated from all causes of shock and hemorrhage or both, occurring in a pregnant woman near term. Of these the most important are ruptured uterus, twisted ovarian cyst, twisted subserous fibroid, and ruptured interstitial ectopic pregnancy.

Premature Detachment	*Ruptured Uterus*
Uterus dilated and very hard.	Uterus contracted.
Uterus in mid line.	Uterus pushed to one side.
Fetus not palpable.	Fetus unduly palpable.
May occur before or early in labor.	Usually only after long, hard labor.
Presenting part does not retract.	Presenting part retracts.
	Twisted Ovarian Cyst or Subserous Fibroid in Pregnant Women
Premature Separation	No evidence of hemorrhage.
Signs of hemorrhage.	Fetal heart tones unaltered.
Fetal heart tones disappear.	No evidence of toxemia.
Toxemia present.	Consistency of uterus normal.
Consistency of uterus hard.	Tumor in abdomen made out alongside of the uterus.
No tumor felt outside of uterus.	History of tumor prior to pregnancy.
No history of tumor.	Usually no apparent hemorrhage.
May be some apparent hemorrhage.	
	Ruptured Interstitial Ectopic
Premature Separation	Usually about fifth month.
Usually late in pregnancy.	Uterus small and to one side.
Uterus enlarged and hard.	Fetus unusually clearly felt.
Fetus difficult to palpate.	X-ray shows fetus outside of the uterus.
X-ray shows fetus in uterus.	Hemorrhage usually all concealed.
May be some apparent hemorrhage.	No toxemia.
Toxemia present.	

Prognosis depends on the type of premature detachment, the surroundings of the patient and the skill and courage of the medical attendant. Maternal mortality figures are given by various authors, ranging from 5.7 per cent to 50 per cent.

The fetal mortality is extremely high, varying from 50 to 85 per cent, according to various authors.

Much of the maternal mortality is due to a failure of the attending physician to recognize the seriousness of the condition in the early stages of the separation, and the temporizing methods of treatment when radical methods should be employed. Mistake in diagnosis also contributes to the mismanagement, because the treatment essentially must be different from that accorded those conditions most closely simulating this condition clinically.

The high fetal mortality is chiefly due to intra uterine asphyxia, before the diagnosis can even be suspected clinically. It is augmented by the fact that the mother is toxic and that the fetus is, in over 50 per cent of the cases, considerably premature, and frequently nonviable.

Treatment

The treatment of premature separation of the normally implanted placenta varies greatly in the hands of different authorities. Thus one man advocates a conservative attitude, delivering practically all cases from below. Another favors radical intervention as soon as the diagnosis has been made. A third individualizes the cases, treating some conservatively and other radically.

I believe that we should attempt to classify the type of case present and the pathology involved, the age and parity of the patient and the duration of pregnancy, and whether or not the cervix is dilated or easily dilatable, before determining the course of treatment.

All pregnant women who bleed even a small amount in the later months of pregnancy should be placed at bed rest, in a hospital if possible, until a thorough examination and careful observation convince the obstetrician that the cause is not a premature detachment of the normally implanted placenta.

In Group I, if the separation is complete, there is nothing to do but the ordinary care of a complete, incomplete or threatened abortion. If the separation is incomplete, as in Group II, rest in bed and sedatives may present further separation, and the fetus may go to viability or even to term, at which time the separated area may appear as a white infarct on the surface of the placenta. It is in this group that the nicest judgment has to be exercised as to the degree of separation, the condition of the baby, and whether or not the best interest of all concerned will best be served by watchful waiting or by radical intervention, and if the latter, what type of intervention is advisable. If a primipara, and especially if an elderly primipara with a viable baby, and if the bleeding is more than a spotting, of if the baby shows some signs of distress, a Cesarean Section is probably the safest procedure to follow. If the baby is just on the border line of viability 28 to 30 weeks and the hemorrhage is moderate and seems to have stopped temporarily, morphine may be given and the patient carried along a few weeks until viability of the baby, providing the patient can be kept in the hospital under close supervision, and radical intervention can be started at any time the symptoms of further separation became evident. If not the uterus should be emptied as soon as evidence of serious hemorrhage presents itself.

If the evidence of detachment first appears when the patient is well advanced in labor, the cervix may be dilated and the baby extracted by version or forceps, as seems best under the existing circumstances. All preparations should be made for the reception and resuscitation of an asphyxiated baby.

In Group III the baby being dead and practically all of the blood loss being apparent, the treatment depends entirely on the filatability of the cervix. It is evident that the uterine muscle has not been overstretched, and that it will be able to respond to pituitrin, ergot, and the pack, if the woman does not lose too much blood before the cervix can be dilated and the baby extracted. If the patient is in labor and the cervix is partially dilated at the time of the accident, completion of the dilatation can be accomplished manually, and if necessary, Durhssen's incisions, made at 10, 2 and 6 o'clock, sufficiently deep to complete the dilatation. Version and extraction or craniotomy may then be done with as little delay as possible to minimize the blood loss. Following the delivery the uterus should be firmly packed with gauze wrung out of a weak lysol solution. Pituitrin and ergot should be given hypodermically and hypodermoclysis of 2000 cc. saline or 5 per cent glucose solution to replace blood loss. Intravenous blood transfusion may be resorted to in the severe cases if a matched donor is available. These patients are in no condition to stand a reaction to a transfusion and every care must be exercised to prevent this.

Group IV and V are the ones that present the most difficult problem and call for the greatest courage, skill and efficiency on the part of the medical attendant and his assistants. I am inalterably opposed to any form of conservative

(*Continued on Page 116*)

Treatment of First Infection Tuberculosis*

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FORMERLY, children with first infection type of tuberculosis were treated in the same manner as adults with the re-infection type, and your part as hospital social workers consisted chiefly in arranging for the hospitalization of the diagnosed case. With the accumulation of information concerning tuberculosis, has come a change in the treatment of the first infection type of disease, as contrasted with the re-infection type, which is the common one treated in adults.

There are two distinct types of tuberculosis in the human body. That which makes the initial attack is known as the first infection type or primary tuberculosis, or if in a lung it has been called the childhood type of tuberculosis. This has been shown to be a very mild form of disease; in fact, it rarely causes significant symptoms and almost never results in much destruction of tissue. This type of tuberculosis, therefore, may be present in the body without ever causing any disability. In fact, in the absence of special examinations, such as the tuberculin test, we are quite unaware of its presence.

The re-infection type of tuberculosis, when present, always succeeds the first infection type and if in the lungs, it has been called the adult type of tuberculosis. This type presents a very different picture. While it is true that our bodies may have enough resistance to overcome re-infections from tubercle bacilli, it is also true that a considerable number of us do not have enough resistance to control this form of disease; hence, symptoms make their appearance, such as fever, rapid pulse, loss of appetite, loss of weight, et cetera. Even after these symptoms appear, some people have or develop enough resistance to bring the disease under control either with or without treatment. Again many persons re-infected with tubercle bacilli do not have or are not able to develop such resistance and their disease continues to progress, and their symptoms to increase, until they are definitely disabled. Such persons have constituted the greater part of the group who have occupied our sanatoriums in the past. The treatment of persons with this type of tuberculosis presents a problem entirely different from that of the first infection type. To restate, the first attack of tuberculosis upon the body results in a very mild form of disease; it rarely causes illness, and rarely, if ever, kills; whereas, disease produced by reinfection may be brought under control but it often causes disabilty and death.

It is the treatment of the first infection type of tuberculosis which I have been asked to discuss. In 1921, when the Lymanhurst School was dedicated, and for several years thereafter, our staff was of the firm opinion that every child who had an inflammatory area of tuberculosis in the lung should become a strict bed patient, either in a sanatorium or in a home. In fact, our viewpoint on the treatment of such cases was precisely as that on the treatment of the re-infection type of tuberculosis. This was because we did not recognize, at that time, the manner in which the body reacts to the two types of tuberculosis. While some parents of children who were found to have areas of disease in the lung accepted our recommendations and sent them to sanatoriums or made strict bed cases of them at home, others were unable to see the need of such treatment, inasmuch as their children presented no outward manifestation of disease. Such parents ignored our recommendations, kept their children at home, allowed them the same liberties as other children in the family and the neighborhood. Many of these parents, however, were sufficiently co-operative to bring the children in for periodic examinations. Thus, we had under observation two groups of cases: one group receiving strict treatment and the other receiving almost no treatment. As years passed, we were amazed to find that the children of the untreated group were as well as those children on strict treatment. Two cases from each group will suffice to illustrate the point.

P. B., at the age of one year in 1922 had been exposed to tuberculosis and her tuberculin reaction was positive. She had a definite area of

*Presented before the 60th annual meeting of the National Conference of Social Work, Division III, Health (Joint Session with the American Association of Hospital Social Workers and National Tuberculosis Association), Detroit, Mich., June 15, 1933. From the Lymanhurst School for Tuberculous Children, and the Departments of Preventive Medicine and Internal Medicine, University of Minnesota, Minneapolis. Prepared with the aid of a grant from the Research Fund of the University of Minnesota. Published in part in the Proceedings of the National Conference of Social Work, December, 1933.

disease in the left lung, located by x-ray films. She was sent to a sanatorium with a poor prognosis as far as recovery was concerned, although she had no symptoms and appeared entirely healthy. She remained in the sanatorium approximately two years. When symptoms failed to appear and lime was deposited in the disease foci, the rigid treatment was given credit for the so-called cure. She is today an apparently normal school child and has never had symptoms of reinfection tuberculosis.

Another case, C. J., is that of a boy who came under our observation at the age of two years, in 1925. He had also been exposed to tuberculosis and his tuberculin test was positive. He had a large area of disease in the right lung, demonstrated by the x-ray film. His mother was told that he must enter a sanatorium. She questioned such advice, on the ground that the child was not ill. There had been tuberculosis in her home, and she knew something of the symptoms of the reinfection type. She finally refused to send him to an institution or to give him any special treatment. He remained among other children, and his regimen did not differ from theirs. In due time, lime was deposited in the foci of the disease, and no symptoms had made their appearance. Today he is an apparently normal school child, and has never had symptoms of reinfection tuberculosis.

A girl of five years, A. H., was brought with her four brothers and sisters for examination because the mother, who had been ill in the home for about three years, had recently died of tuberculosis. The brothers and sisters were found to have deposits of lime in their lungs and at the lung roots, but this girl had an inflammatory area in her right lung. This was in 1925 when we still threw up our hands at such findings and rendered very grave prognoses. The father was advised to have her admitted to a sanatorium at once. He did this, but at the end of approximately four years in the institution, she had developed no symptoms of reinfection tuberculosis, and lime was abundantly deposited in the foci of disease. She is at present an apparently healthy school child.

Another case is that of a girl, M. X., who was brought to us at the age of eight years, in 1924. She had a positive tuberculin test and a history of exposure to tuberculosis. The x-ray film revealed a rather large inflammatory process in the right lung. The mother was strongly advised to have this girl hospitalized and was told that if she did not send her to a sanatorium she probably would not recover. The mother did not accept our advice and the family moved to another state. Our staff members often mentioned this case, and assumed, of course, that she had died. A few years later the same girl was brought to our clinic, the family having returned to their former residence. Very much to our surprise, she was an apparently healthy girl, who according to her mother's statement, had had no treatment, nor had she at any time presented symptoms of disease. The X-ray film showed deposits of lime in the old foci of disease. Today she is an apparently normal girl.

These four cases illustrate beautifully the two groups. The untreated group left us with no basis upon which to argue for bed rest or sanatorium treatment. Therefore, we no longer recommend any drastic treatment for cases of the first infection type of tuberculosis.

The following illustrate our present management:

A child of twenty-two months, B. C., was brought in for examination because her father had extensive tuberculosis. She was apparently normal, but had a positive tuberculin reaction and the x-ray film showed a rather large inflammatory process in the left upper lobe. The father was advised to enter an institution for treatment, since he was without funds and had the re-infection type of disease and was disseminating tubercle bacilli to his children and other associates. This broke the contact exposure and prevented the re-infection of the child. The rest of the family was tuberculin-tested. Although the results were all positive, none was in the class of spreaders or carriers of tubercle bacilli, hence there was no further exposure for this child in the home. The mother was told that she need not worry about the infant's health, provided the re-infection type of disease did not make its appearance. Some neighbors heard of the recommendation and insisted that another physician examine this child When he saw the x-ray shadow he became as much alarmed as we would have a few years before this. He recommended immediate hospitalization. This recommendation was accepted, but after a few weeks in the sanatorium the family removed the child. Although she had pleurisy with effusion, in due time lime made its appearance in the foci of disease, and now, five years later, she is apparently normal. There has been no symptoms of tuberculosis, except when the pleural effusion was present.

A boy of eighteen months, K. LaV., was first examined after his father had been found to have rather extensive tuberculosis and was disseminating tubercle bacilli. This infant's tuberculin

test was positive, and he was found to have quite a large inflammatory area in the right lung. The father was immediately sent to an institution, hence the exposure of the child was stopped. We informed the mother that she had nothing to fear unless this child had already been or should become re-infected. To prevent this, the family, as well as the child, has been observed periodically to determine their health status, as far as tuberculosis is concerned. She kept him at home and treated him as any normal child would be treated. Today, four years later, lime deposits are visualized on the x ray film in the old foci of disease, and there has been no outward manifestations of tuberculosis. When school age is reached, attendance at a special school for the tuberculous will be recommended.

Our great educational campaign against tuberculosis, together with some probable factors which we do not understand, have borne fruit so abundantly that today large numbers of infants and children escape contamination with tubercle bacilli and many adults have not been infected. When such adults do become infected for the first time, they develop the same benign type of tuberculosis as seen in the bodies of infants and children. Therefore, we no longer recommend bed rest or hospitalization for adults when they develop the first infection type of disease, but treat them in the same manner as children with the same disease.

When interest in children with tuberculosis was aroused, and before we knew that the vast majority of them have only the benign first infection type of disease, the problem of providing hospital facilities seemed stupendous. In fact, some sanatoriums hastened to construct one or more buildings for such children, but with our new knowledge of tuberculosis some of them have already found it advisable to convert such buildings into other uses. Some of these buildings were erected in close proximity to the main sanatorium buildings, and very little attention was paid to the protection of children against further exposure to tubercle bacilli. Often they used the same dining room, the same recreation room, et cetera, as the open adult cases of tuberculosis, and by so doing were inviting the reinfection type of disease. The child who has already developed the reinfection and destructive type of tuberculosis, when hospitalized is best treated in the regular sanatorium buildings. Inasmuch as this form of disease is not common among children, there is little or no need for special children's buildings.

The next movement had to do with the construction of preventoriums for children. Some were built and admitted children from homes where they had been exposed to tuberculosis and a good many had been made orphans because of tuberculosis. Some institutions admitted any child who was below par. A great wave of enthusiasm swept over the country. Some advocated that every child who had been exposed to tuberculosis be placed in such an institution but, fortunately committees were appointed and on them were conservative as well as enthusiastic individuals. The conservative group was able to stem the tide until it was shown that the preventorium is not the solution; that institutionalization really is not good for a child except when he is ill. The child with the first infection type of tuberculosis is not actually ill. Park and others have called attention to the fact that "hospitalization of infants to prevent infection from tubercle bacilli is usually unwise because it probably causes the death of more babies from non-tuberculous infections than it saves deaths from tuberculous infections."

The summer camp for tuberculous children is little more than a gesture. I am doubtful whether it has any more value than providing an outing for the chidren. It is based largely upon obsolete views concerning the effects of outside air on the healing of tuberculosis. Ventilating engineers have shown that conditioned air is far superior to outside air in almost any part of the country at any time of the year. Contamination, temperature and humidity too high or too low, counteract the chief argument for the summer camp. Taking a child from a home where there is exposure to tuberculosis to a summer camp is laudable but to return the child to the same home without providing adequate protection against exposure is detrimental. A properly supervised camp trip is good for any child who is not ill. Such camps as those provided by religious organizations, luncheon clubs, philanthropists, et cetera, are excellent, but for a tuberculosis organization to make claims for the camp as a major factor in tuberculosis control is absurd. Sometimes such camps are used to impress the public with the idea that the tax money or even the money they spend on Christmas seals is being used to good advantage. A community which already has a program providing for all of the major factors in tuberculosis control work and finds that the only thing left to do is to start a summer camp is justified, but such communities are extremely scarce. Usually where summer camps are already in existence, there are many other far more important phases of the work which should demand the time and effort

of the workers and all the money available for tuberculosis control.

At the close of twelve years' observation on children with the first infection type of tuberculosis, the Lymanhurst medical staff is strongly of the opinion that sanatoriums and twenty-four hour preventoriums are usually unnecessary in the treatment of children with the first infection type of tuberculosis. In fact, we are of the opinion that the time is not far distant when the administration of a sanatorium, or of any tuberculosis organization, will feel apologetic for maintaining in tax-supported sanatoriums children who have only the first infection type of tuberculosis. Our observations on these children have convinced us that the use of their homes, foster homes when necessary, the family physician, clinics for the needy, the school system, nursing and social organizations, is the best solution of the treatment and protection of such children. The individual's home is surpassed by no other place when the source of exposure is discontinued and the other home conditions are good. Children who have been made orphans by tuberculosis and children whose homes are not or cannot be made right for their protection are far better off when placed in certified foster homes.

The question immediately arises as to the safety of the members of the family who make a foster home for a child with the first infection type of tuberculosis. Of course, such a child has foci of disease in the body but fortunately most of them do not eliminate tubercle bacilli by way of the mouth, as persons with the reinfection type do. Considerable evidence has accrued to show that tubercle bacilli are cast from tuberculous lesions of the first infection type when the disease is in the acute inflammatory stage, but following this stage bacilli are rarely found in the excreta. Fortunately, children usually do not expectorate; in fact, even when the disease is in the inflammatory stage, they rarely cough. Therefore, tubercle bacilli cast from the lesion usually find their way through the trachea to the throat and are swallowed. Thus, examination of the gastric contents and of the feces reveals them. Apparently, the danger of tubercle bacilli eliminated by way of the intestinal tract reaching the bodies of others is slight. Therefore, children with the first infection type of tuberculosis do not present as serious potentialities, from the standpoint of the spread of their disease to others, as persons with the reinfection type of disease. Thus, we are usually able to give members of families who desire to make foster homes for such children a reasonable assurance that there is no danger of them contracting the disease.

In rural and small town schools, these children may remain in their usual classes and mingle with other children. In larger places, when there is a sufficient number of them, special rooms may be set aside for their instruction and observation. In still larger places, special schools may be used. However, we are beginning to believe that even this is not necessary. If a period of rest can be provided some time during the day, preferably after lunch, these children may remain in their regular classes. While the rest may not be absolutely essential, at the same time it is good for any child regardless of tuberculosis.

In the earlier part of this paper, one may have gleaned the impression that the child with the first infection type of tuberculosis presents a very simple problem; that the disease is not serious and, therefore, one need have no concern about it. I now want to point out quite the contrary. The problem is a very complex one. The disease is serious and we should be much concerned over each child with the first infection type of disease, that is, every child who reacts positively to the tuberculin test. In the earlier part of the paper, the immediate effect of the disease was under consideration. We must now discuss the remote effect in the light of actual facts.

Every child reacting positively to the tuberculin test has in his body at least one focus of tuberculosis; that is, the first infection type of disease is present. The fact that it is causing him no illness and that it is not destroying his tissues at that particular moment does not mean that it is under control for all time. The tubercle bacilli are capable of living in such foci over long periods of years and at any time may escape from them only to set up new areas of disease. If large numbers of such new areas of disease are established, the individual usually succumbs in a short time from such conditions as tuberculous meningitis or miliary tuberculosis. If smaller numbers of new areas of disease are established by the spread of the tubercle bacilli into the lung, bones, joints, etc., there acute inflammation is set up but after a time the disease becomes chronic. Unfortunately, we have no specific measures to prevent the spread of tubercle bacilli from these first infection foci of disease to other parts of the body. Therefore, children are at the mercy of tubercle bacilli once they are allowed to enter and establish foci of disease in their bodies.

A second danger is that once the first infection type of disease develops in the body, it becomes sensitive to the products of growth of tubercle bacilli and thereafter it is more dangerous to be re-exposed to tuberculosis. Therefore, complexities begin to loom when we consider care for the child with the first infection type of disease. The problem is a serious one and these children demand constant attention. First, living conditions must be made right and kept right as far as subsequent exposure to tuberculosis is concerned. From this point on, the hospital social worker's aid is invaluable, since it is her responsibility to check on these conditions. The fact that a mother has died of tuberculosis and was the source of the first infection type of disease in a child does not mean that other sources do not exist in the same family or among other close associates. If examination of all the members of a family and other close associates proves that there are no other open cases of tuberculosis at that particular moment, it does not mean that such cases may not develop at any time. Therefore, the members of families of homes, foster homes, teachers, and the other intimate associates of these children should be re-examined at least every year. Here again the hospital social worker comes into the picture in this follow-up program. Although we know little about resistance of the body to tuberculosis, we assume that children who have foci of the first infection type of tuberculosis in their bodies should be provided regularly with all the daily food requirements of their bodies and that they should have adequate rest. Even though it may be shown that these many not prevent later dissemination of their tubercle bacilli, they are necessary for the growth and maintenance of their bodies. Therefore, they should be adequately provided. The magnitude of the simple recommendation to properly observe these children with only the first infection type of disease is such that without the co-operation of the social agencies it is an impossibility.

Every child with the first infection type of tuberculosis, from its beginning in the inflammatory stage and even after lime has been deposited, is a potential case of the reinfection type of disease, which causes illness and destruction of tissues. If there is a sudden spread of the bacilli from the original foci to many parts of the body, resulting in tuberculous meningitis or miliary tuberculosis, there is little to be done by way of treatment except that of a palliative nature. When the chronic reinfection type of disease makes its appearance, whether it is due to the spread of bacilli from the first infection type of lesion or whether it is due to subsequent exposure to bacilli from others, there is much to be done when the reinfection type of disease is detected early. We are not aided in its detection by the tuberculin test, as that has been positive since the first infection type of disease developed; we are not aided by symptoms, since they usually make their appearance after the disease has become rather extensive; we are not aided by physical examination since abnormal signs are usually absent in the early development of the reinfection type of disease; we are not aided by the X-ray film examination when the lesions first start to develop, but long before they cause symptoms or abnormal physical signs they become sufficiently large to be visualized by the X-ray film examination. In our observations at the Lymanhurst School, we have frequently seen X-ray shadows, produced by reinfection type of tuberculosis, years before any symptoms or abnormal physical signs were present. We have seen these shadows slowly but surely enlarge and eventually if treatment is not administered, the individual becomes ill with the reinfection type of disease during the teens or early twenties. This fact emphasizes the treacherousness of tuberculosis and proves the great need of most careful observation and periodic examination, including X-ray films, of all children who have the first infection type of disease.

Once the re-infection type of disease makes its appearance on the X-ray film, even though the child is not ill, as is usually the case, treatment is definitely indicated. At this moment, we are able in a high percentage of cases to direct the disease toward healing. In some cases, strict bed rest may be indicated in the home or in an institution, but in a good many cases, in fact I believe the majority of them, collapse therapy will promote healing without much bed rest. Bed rest alone fails so often that we have lost much of our confidence in it. While it is true that some of these lesions will come under control without any treatment whatsoever, we have no way of identifying them, and inasmuch as so many tend to progress and are moderately or far advanced when symptoms or abnormal physical signs make their appearance, it behooves us to detect them by X-ray and treat all at the earliest possible moment. Our former methods of symptoms and physical examination have proved of little avail since 80 per cent or more lost their best chances of recovery before treatment was instituted.

There has been a strong tendency in this

country to minimize the importance of the first infection type of tuberculosis in the bodies of children. This tendency, no doubt, is due to the fact that such children appear in good health. With our new knowledge of the subject, we must realize that children with this type of tuberculosis, no matter how well they appear, and even after the deposition of lime, will contribute the greater part of the tuberculosis load of the future in any community. By recognizing the first infection type of tuberculosis in children as a serious problem and by administering the necessary treatment, consisting of prevention of further exposure, good living conditions, frequent periodic examinations, including X-ray films, we are simply pushing our lines back to the very beginning of tuberculosis, where it is most easily controlled.

PREMATURE DETACHMENT OF THE PLACENTA

(Continued from Page 110)

management in these cases. There is only one defensable position for the obstetrician to be in. He must open the peritoneal cavity and be in position to control the blood supply to the uterus if necessary. It may not be necessary to remove the uterus in all cases of these groups. It will be necessary more often to Group V than in Group IV. No time should be lost. The operating room and patient should be prepared immediately, and the patient's blood matched with a suitable doner at once. Preparations are made for subcutaneous injection of saline during the operation. If the patient is in shock she should be given stimulants and kept warm. The abdomen should be opened under local anesthesia or ethylene. The presence of blood in the abdominal cavity is a bad sign, as is also a flaccid uterus. The uterus is incised and the baby, placenta and clots rapidly removed. Pituitrin is given into the uterus and an attempt made to make it contract down by massage. If it stays flabby and bleeds, immediate supracervical hysterectomy is done. As soon as the arteries are clamped the saline hypodermoclysis and the blood transfusion are started. As stimulants, caffein, sodium benzoate and strychnine are given and oxygen is administered by the anesthetist. It should not take more than thirty minutes to complete the operation. If the uterus responds well to stimulation it is not removed, but is sewed up and dropped back in the abdomen.

If operating room facilities and proper assistants are not available, what then? The outlook is gloomy, but not hopeless. The dilatation of the cervix is the important factor. If the patient is a primipara with a resistant uneffaced cervix, a No. 5 Voorheese bag may be inserted and traction applied to hasten softening and dilatation. As soon as the bag is expelled, dilatation should be completed manually or by Duhrssen's incisions, and the baby delivered by version or craniotomy.

Following the delivery of the baby in these cases, the uterus should be firmly tamponed with a ten yard strip of gauze wrung out of one per cent lysol solution. It is our custom to insert this into the uterus after removing all clots in the following manner:

A mason jar containing the gauze is held to the left of the operator about three inches from the vulva. With a packing forceps a handful of the gauze is removed into the palm of the left hand, the fingers of which have been introduced into the vagina. The mass of gauze is then carried up into the uterus and thoroughly packed into one cornu, counter pressure being made with the right hand through the sterile sheet on the abdomen. The left hand is then withdrawn and again filled with gauze, this is carried up into the uterus and the opposite cornu is packed. This maneuver is repeated and uterine cavity is packed tightly from above downward. The vagina is then also packed tightly. A tight binder is applied to the abdomen. Hypodermoclysis of saline solution and blood transfusions are resorted to, if the condition of the patient warrants. In the event that bleeding occurs through the pack or that there is intra-abdominal hemorrhage, even though the intra-uterine hemorrhage has been controlled, it is best to open the abdomen under local anesthesia and remove the uterus, if facilities are available.

The keynote to the management of these cases is promptness in making the diagnosis as to the degree of separation, and the resultant pathology, and courage to adopt radical measures, if possible, before the development of a desperate situation for the patient. To this end, persons responsible for the care of obstetrical cases should have a plan of action definitely worked out in their own minds and before such a case presents itself. Only in this way will the fight for decrease of the frightful mortality as given by certain statistics be won.

For the isolated practitioner, the handling of these cases is more difficult, but if the condition is recognized early and prompt action taken, with the assistance that is available in most communities, he can also handle these cases with relative safety.

Recent Advances in the Treatment of Detachment of the Retina

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ONE OF the dark chapters in ophthalmology has been the treatment of detachment of the retina. The usual termination is blindness. In certain cases, traumatic in origin, re-attachment may occur.

The condition was well recognized in pre-ophthalmoscopic days. An anatomical examination was made in 1722 by d. Saint Yves.

The causes of this condition are many. Secondary detachment due to tumor, infection, iridocyclitis and retinitis, are slow in progress and beyond help. Certain cases due to injury without penetration of the globe are of sudden occurrence. Spontaneous re-attachment may take place with rest and quiet. Detachment due to hemorrhage is sudden and may disappear with the absorption of the blood.

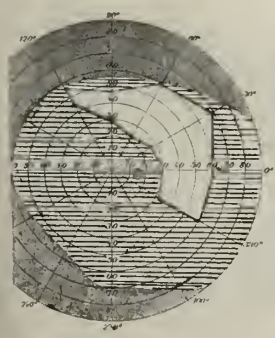
The majority of the cases are primary or idiopathic, and are due to a degenerative change in the eye. Eighty per cent of all cases of detachment are in myopic eyes and generally in persons over forty years of age. Detachment often follows strain or sudden effort, as lifting, sneezing, coughing, pregnancy, etc. The loss of vision is immediate and is noticed by the patient, in contrast to the insidious loss in cataract, glaucoma, atrophy, or tumor. Consequently, a physician is consulted early. In the past, the ophthalmologist, in making the diagnosis of primary detachment, has given the patient a hopeless prognosis and has entered on a long and futile treatment of rest and diaphoretics.

Spontaneous recovery is the exception; cataract, chronic iridocyclitis and blindness is the final outcome. Fortunately, both eyes are seldom involved, and, if so, both are not affected at the same time. In the majority of the cases the detachment is down, or becomes so, due to the fluid gravitating downward. The macula is rarely involved and rarest of all, the medial side. Degenerative changes in the choroid and retina cause a thinning and weakening of the latter. A sudden strain produces a tear in the retina, through which the degenerated vitreous prolapses. These tears are frequently multiple, due to different areas of choroiditis.

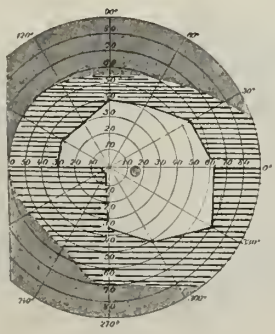
Sichel, in 1859, suggested surgical interference by tapping the subretinal fluid by puncture of the choroid and sclera. The results were not satisfactory. Galezowski, in 1872, suggested iridectomy and later a second operation in which he injected tincture of iodine in the subretinal space, with valueless and meagre results. Other sclerosing agents, Lugol's solution, biniodide of mercury, and iodide of sodium were suggested. Schonfeld, in 1892, reported twenty-five successes in a hundred cases by the use of mercury and sodium iodide. De Wecker proposed, in 1892, galvanic puncture, and Deutschman, in 1894, evacuated the fluid and injected vitreous of the rabbit, with failure.

Vogt states that in 1881, Martin, de Wecker and De Luca, each suggested ignipuncture to evacuate the fluid. The operation was frequently used by both French and English oculists. Deutschmann, in 1899, reported a case in which he had used ignipuncture, in 1896, at the site of the retinal tear. Galesowski of Paris, not only performed ignipuncture, but aspirated the retro-retinal fluid before this procedure, and used the cautery on the tear.

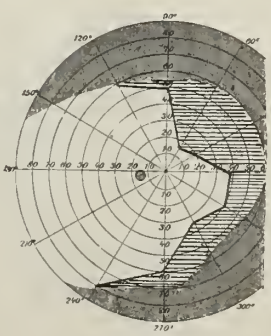
All operative procedures have offered little



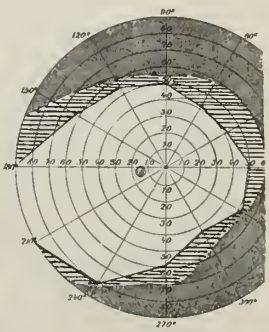
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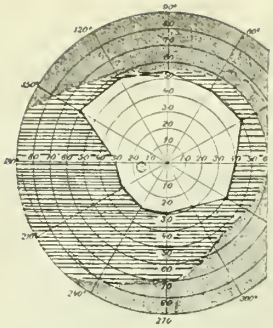
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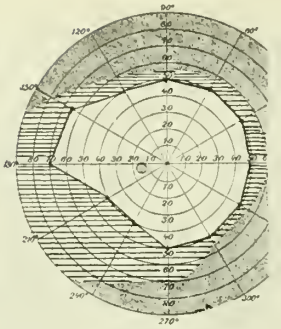
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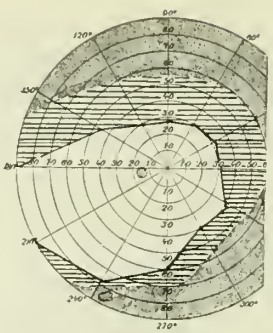
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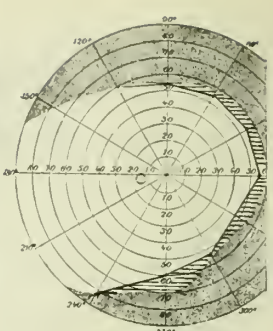
3A



3B



4A



4B

relief for this terrible condition. During the past three years, however, new methods have been devised which offer some hope of cure.

Gonin, of Lausanne, some five or six years previous to the publication of his paper in 1929, had been treating detachment with actual cautery. This is plunged through the sclera, so as to cause the edges of the retinal tear to adhere to the choroid. In May, 1930, he reported 240 cases so treated. The first report of this method to appear in English was one by A. W. Osmond in the British Medical Journal of May 24, 1930. Since then, many writers have reported cures in one-third to one-half of cases.

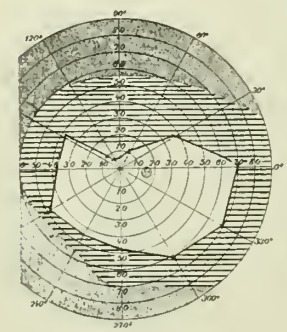
Gonin's theory is that spontaneous detachment is due to degenerative changes in the eye in which liquefaction of the vitreous takes place and retino-choridal changes occur, especially in the region of the ora serrata. These are often difficult to observe with the ophthalmoscope. Evidence of this degeneration is seen in the fine floating opacities in myopic and senile eyes. A sudden or unequal strain on the retina is followed by a tear of this fragile membrane and through the opening the thin fluid of the vitreous escapes. The retina is raised from the pigmented layer, and as time goes on, the tear increases in size or new ones form, causing larger or new detachments.

Gonin's method consists of first accurately locating the tear or tears. The conjunctiva is reflected away from the sclera. The area on the sclera is marked with gentian violet corresponding to the hole in the retina. The subretinal fluid is evacuated by making an opening in the sclera with a knife or trephine. The point of a glowing cautery is inserted through the scleral opening so as to seal the edges of the retinal tear and cause it to adhere to the choroid. There is considerable difficulty in accurately locating the hole, or retinal tear, and the cautery may give rise to vitreous changes.

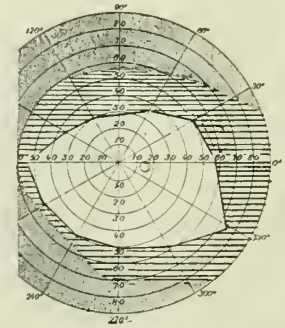
Guist of Vienna has modified the method. A series of four to twenty small trephine openings are made in the sclera around the area corresponding to the tear in the retina. Fluid is evaculated by penetrating the choroid with a blunt spatula. These openings are touched with caustic potash (KOH) which is neutralized with one-half per cent acetic acid. It is not necessary to accurately locate the hole in the retina.

Linder has reported reattachment in four cases where there was a hole at the macula. The fluid between the retina and the choroid is evacuated and three per cent solution of potassium hydroxide (0.01 ro 0.02 cc.) is injected into the subchoroidal space.

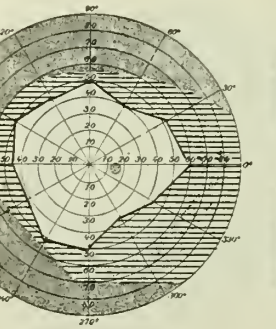
Bad results have been reported as necrosis may result from the caustic. A second objection is that it is a time consuming operation as the trephine openings are especially difficult to make if the eye becomes soft from injury to the choroid



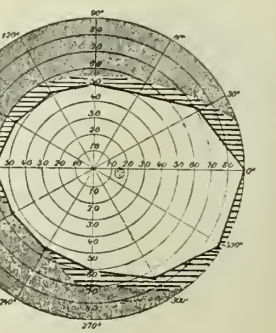
5A



5B



6A



6B

by deep penetration of the trephine, thus evacuating the subretinal fluid.

Larsson (May 1932) has suggested that diathermy electrode two mm. in diameter be applied to the sclera. This produces adhesions between the retina and the choroid. This is a simple method and free from the objections of the Gonin and Guist methods. It seems to be a safer and better surgical procedure than the chemical or actual cautery and it is not necessary to accurately seal the wound in the retina as advocated by Gonin. Likewise, Larsson does not feel it essential to actually cauterize the edges of the retinal tear. By the methods of scleral electrodiathermy, he had 50 per cent of cures in forty cases. In his operation, the tear is located as accurately as possible. The conjunctiva is freed from the sclera. A barrage of burns, six to twenty in number, is made in the sclera with the diathermy electrode, two mm. in diameter, around the area corresponding to the tear. The fluid is then released and the retina adheres to these burned areas.

Weve uses the blunt active diathermy electrode on the sclera and in addition a fine needle which punctures the sclera and choroid. This causes adhesions of the retina to the choroid.

Kronfeld, of Chicago, uses a fine needle as the active electrode, the indifferent one being a large lead plate applied to the thigh. The current in the diathermy point is applied to the sclera; as soon as the latter is penetrated and the point enters the subretinal fluid, the meter will register 40 to 60 miliamperes. More than 100 miliamperes should not be used on account of damage to the lens and ciliary region. At the last puncture, the fluid is released and the retina comes in contact with the multiple burns.

Walker, of Los Angeles, has devised platinum points to be used with the diathermy. These are placed through the sclera, the current is used for about three seconds and the point is left in place. After the required number of needle points are used (10 to 20) they are removed at the end of the operation. By the use of the multiple platinum points, which are left in the sclera until the end of the operation, loss of tension of the eye is avoided.

In the past, I have had patients recover from traumatic detachment by rest in bed. (Case 4). Some have been improved by a simple trephine opening in the sclera, thus evacuating the fluid. (Case 1 and 2). Recurrence has followed in every case with the exception of one patient (Case 3) who has been observed five years. Improvement has followed the use of cautery and the KOH (Case 5). Patients must be under observation many months as detachment may reoccur. Patients so far treated with diathermy have been observed too short a time to determine the outcome. Diathermy is, in my experience, safer and easier to use.

Conclusions

Due to recent advances in ophthalmology, idiopathic detachment of the retina is not a hopeless condition. Various operators have reported from a third to a half of the patients cured.

The evacuation of the subretinal fluid gives a temporary but not permanent improvement.

The use of the cautery or caustic to cause the retina to adhere to the choroid is followed by permanent cure in 35 to 50 per cent of the cases.

The Diathermy method seems, to date, to be the simplest, the most satisfactory, and freer from danger than the use of the cautery.

Surgical Consideration of Diseases of the Thyroid Gland: A Clinic*

John deJ. Pemberton, M.D.†
Rochester, Minn.

CASE 1: Adenomatous goiter without hyperthyroidism. DR. PEMBERTON: This lady, aged forty years, came here this morning to bring her daughter as a patient. We happened to note her condition, and as we had no other case of adenomatous goiter without hyperthyroidism we asked her to let us present herself to you.

She gives a history of swelling in the neck of two years' duration, with some recent growth, and we find an encapsulated, nodular tumor. When she swallows it moves and apparently is an adenoma of the thyroid gland, without any symptoms of hyperthyroidism.

Treatment for a patient of this kind must always be thought of seriously, and I believe that before one advises a patient to have the goiter removed, or to keep it, he should fully acquaint the patient, or himself be acquainted, with the potentialities of the disorder. If the goiter is not removed there are three potential dangers. The first of these is enlargement of the growth, with compression of the trachea. Unless there is tracheal compression at the time of the examination there is little danger that the subsequent growth of the tumor or tumors will suddenly and unexpectedly produce serious obstructive symptoms. The enlargement is commonly slow, and if symptoms of compression develop they will be fully revealed to the patient long before there is any actual danger of acute suffocation. Therefore, I would not seriously consider that there is any urgency in operative treatment because of this potential danger.

The second potential danger is that of hyperthyroidism, or so-called toxic adenoma developing. It is impossible for anyone to know just what percentage of patients with this type of goiter finally becomes toxic. The percentage any physician sees in his practice does not represent a cross section of the country, for many patients without hyperthyroidism do not seek medical advice and commonly those with hyperthyroidism do seek advice. Therefore, it is impossible to know just what the chance is of hyperthyroidism developing later in a case such as this. In a large series of cases of adenomatous goiter with hyperthyroidism, Plummer found that the average duration of the goiter before symptoms of hyperthyroidism developed was fourteen to seventeen years. In The Mayo Clinic about 42 to 49 per cent of the patients operated on for nodular goiter have hyperthyroidism. If we say that the chance of hyperthyroidism developing, is 25 per cent, why is it wise to advise a patient to have an adenoma removed before hyperthyroidism appears? The answer lies in the fact that the onset of hyperthyroidism is so insidious that commonly the patient is totally unaware that there has been any appreciable change in her condition until visceral degeneration has developed, usually manifested by cardiac and hepatic injury. Then the operative risk is increased and the chances of cure are lessened.

The third danger is that of malignancy. Here again we do not know the relative incidence of malignancy and goiter, but in every study that has been carried out in a large series of cases it has been found that malignancy has developed in a preëxisting nodular goiter in about 90 per cent of the cases. Therefore, I think one cannot get away from the idea that an adenomatous nodule may be a precursor of malignancy. Can malignancy of the thyroid gland be diagnosed before the growth has invaded the capsule and has become fixed to the surrounding tissues? There are changes in size, such as recent, rapid growth, which may lead one to suspect malignancy. When the tumor has involved surrounding tissues, such as the laryngeal nerve, muscles, and so forth, and the diagnosis is apparent, the chances of cure by operation are greatly lessened. It has been our experience in cases of carcinoma of the thyroid gland, in which operation has been performed, that in 65 per cent the physicians did not suspect carcinoma, and the surgeon, after he had the growth in his hand, did not suspect it in 35 per cent. The malignancy in these cases is within the adenoma, and only after its removal and after the tumor has been sectioned, can the presence of malignancy be determined. The three potential dangers of a neglected adenomatous goiter are, therefore; (1) enlargement with possible tracheal obstruction; (2) development of hyperthyroidism, and (3) development of malignancy.

I would not advise that every adenomatous

*Presented before the North Dakota State Medical Association, Valley City, June 1, to 2, 1933.
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thyroid gland be removed, but I think that the physician who advises the patient to keep the goiter should fully explain to that patient the risk he runs. Although we cannot diagnose early malignancy by clinical means, I do not think we should look on a nodule in the thyroid gland in the same way in which we look on a nodule in the breast, for instance. The incidence of carcinoma of the thyroid gland is not nearly so great as that of carcinoma of the breast, but I do believe that the patient should have explained to her the potentialities, and if she does not wish an operation she should be advised to have at least periodic examinations. The risk of operation is less than 0.10 per cent. What are the chances of recurrence? After twenty-five years of age the chance of recurrence is less than 0.5 per cent. We do see so-called recurrences, but I am convinced that these cases are not true recurrences in the sense that new tumors have developed, but that they are enlargements of adenomas that have been overlooked at operation. Perhaps the growth has been removed from one side but an adenoma overlooked on the opposite side. The operative morbidity is exceedingly small in this type of goiter.

Case II: Andenomatous Goiter. (Dr. C. J. Meredith).

Mrs. B. S., aged 28, has three sisters who have goiters. She states that her goiter has been present all her life. She had a thyroidectomy in 1919 in St. Paul. The growth recurred in six months and increased in size for two years but for the past twelve years has remained stationary. She says she has been hoarse for one month. She complains of a tired feeling, eats well and has had no loss of weight. She complains of a choking sensation on exertion.

Examination reveals an extremely large, irregular thyroid gland, more marked on the left with nodules in both lobes. Her breast development is under normal and she has been unable to nurse her babies. Her blood pressure is systolic, 160, diastolic, 80; pulse, 70. Basal metabolic rate,—16. No toxic symptoms.

Dr. Pemberton: This patient was operated on at the age of thirteen years, and apparently at that time she had a colloid goiter which contained an adenoma. Apparently, at that time, right partial lobectomy was performed. Now we find that the trachea is pushed far to the right. Most of the enlargement is on the left side and marked tracheal compression is present, as you can readily note from her cough. Always a nerve injury can be detected by the character of the cough, and this "tracheal" cough is very characteristic. The metabolic rate is —18 per cent. There is no evidence of myxedema, but operation I believe is fairly urgent. There are two reasons: Tracheal compression is present, and the chances are good that the goiter will continue to grow. Then, I think, hyperthyroidism associated with adenomas can be better treated by feeding preparations of thyroid after removal of the adenomas than in the presence of the adenomas. I am not certain what influence administration of iodine has on patients who have simple adenomas. Many observers think it will induce hyperthyroidism; it probably will if large doses of iodine are given, but we have no definite evidence of this, and certainly no evidence that iodine in prophylactic doses will activate a nontoxic goiter. I am of the opinion this patient would be much better if the goiter were removed. If anyone differs with me, or wishes to suggest anything, I should be very glad if he would speak.

Case III: Adenomatous Goiter. (Dr. C. J. Meredith).

Mrs. H. S., aged 62, had a cyst removed from her neck eight years ago. She has had attacks of gall stone colic for years.

When first seen in September, 1931, there was a large, diffuse enlargement of the thyroid in the left and isthmus. The gland was soft, there was no bruit, and no tremors of the hands. A loud systolic murmur was heard over the midsternum, transmitted to the axilla and there were occasional missed beats. Her tonsils were septic. Blood pressure: Systolic, 170, diastolic, 80; pulse, 90.

May 30, 1933 she stated that she has felt fairly well since the last examination, except for dyspnea on exertion and inability to sleep. She has a voracious appetite. For the past month she has palpitation of the heart and it was necessary to go to bed for ten days. Her physician placed her on digitalis. She complains now of weakness but has had no loss of weight. The basal metabolic rate is +60.

Case IV: Adenomatous Thyroid. (Dr. S. A. Zimmerman).

Mrs. H. B., aged 53, has a negative family history, she has an enlargement of the thyroid gland in the right side. She has lost weight for the past four years, her heart is rapid, she is extremely nervous and tires easily. There is no evidence of exophthalmos. She states that she had an attack of articular rheumatism several years ago, and diphtheria twenty years ago.

Examination shows no abnormality of temperture; her pulse is 130; the heart sounds are

normal. Blood pressure 164/80. The metabolic rate is +30. Her kidneys are negative.

Case V: Adenomatous Goiter. (Dr. C. J. Meredith).

Mrs. G. M., aged 56, states that her mother had a large goiter. The patient's goiter has been present for twenty years; it increased in size fourteen years ago during her last pregnancy and has remained large since that time. For several years she has tired easily and for the past two years has had palpitation on exertion. She sleeps well, her appetite is good and she has had no loss of weight.

Examination shows infected tonsils and a large, movable adenomatous goiter, more noticeable on the left side. No nodules are palpable. There is no tremor or tachycardia, and the eyes show no evidence of exophthalmus. The blood pressure is 148/74; pulse, 72. The basal metabolic rate is +21.

Dr. Pemberton: All three of these patients, (cases 3, 4, and 5), give definite evidences of hyperthyroidism. If we would all get into the habit of thinking of hyperthyroidism in terms of tissue metabolism, rather than thinking of it as a definite syndrome, or symptom complex, it would be much easier to detect the presence of hyperthyroidism. If we think of the condition in relation to increased metabolism, then all the symptoms (the loss of weight in spite of a good appetite, tachycardia, weakness, intolerance to heat, increased sweating) fit into the picture of increased tissue metabolism. I think many observers rely entirely too much on the metabolic test. One test commonly is not of very much significance. To be of any value, the test must be done accurately; that is, the patient must be at rest, must be breathing quietly, and must have gone without food for at least twelve hours. It must be remembered that this is a complicated test and that errors in tabulation of figures readily can occur. I have seen numbers of cases in which there was definite evidence of hyperthyroidism with a normal metabolic rate, or one rate may be excessively high and evidently not the the true basal rate. If we think of the symptoms in terms of tissue metabolism it is much easier to estimate the basal metabolic rate and not be misled by a laboratory report which may be true in itself but false in implication.

To me, the patient's tolerance to heat and cold is of great clinical significance in determining the presence or absence of hyperthyroidism in a doubtful case. If these patients are asked how they stand the heat, and they say that they have to keep the temperature of the room cooler than is comfortable for the other members of the family, or that they need less covering at night than other members of the family, then a careful examination is necessary to exclude hyperthyroidism. If the patients are not intolerant to heat, it will be difficult to prove that they have hyperthyroidism.

This lady of case three has a basal metabolic rate approaching +60 per cent, which, of course, is a high rate. There can be no question of what to do in a case of this kind. Nothing can be done to cure the patient aside from removing the tumor, which seems to be a single adenoma. Administration of iodine may improve her temperarily, but I believe that she could take iodine indefinitely and never be cured. It has been the experience of everyone who does operations on the thyroid gland that in cases of adenoma with hyperthyroidism removal of the adenomatous tissue results in cure of the disease, in the same sense that a patient with an ovarian cyst is cured by removal of the ovary. No one makes this claim in cases of exophthalmic goiter, but if we remove an adenoma we cure the patient.

Do they recur? Several years ago, Dr. Plummer went over all our records and found three or four patients who had returned with recurrence of adenomatous goiter with hyperthyroidism. I think those cases can be explained by the fact that in the early days we removed only one lobe of the thyroid gland, and a small growth, that possibly was overlooked, subsequently enlarged and later became toxic.

With a basal metabolic rate of around +60 per cent, this patient will soon be in the emergency stage. The heart and liver will be affected. The question arises: Does hyperthyrodism, per se, without hypertension or organic disease of the heart produce congestive heart failure? There are differences of opinion, but I think the censensus is that it can. True, in most instances these patients have endocardial lesions or hypertension, but I am convinced that hyperthyroidism alone, without any cardiac lesion, is capable of producing cardiac enlargement and even congestive heart failure.

This patient presents another important problem. She has a history of attacks of disease of the gallbladder. If a patient has hyperthyroidism, and in addition has another condition which requires surgical intervention, it has been my experience that thyroidectomy should as a rule be the first operation, unless the second condition is so grave as to present an emergency. In the past, when this rule has not been followed, very serious thyroid reactions have complicated the

first operation. These could have been avoided if the goiter had been removed previously. It is obvious that should this patient become deeply jaundiced from a stone obstructing the common bile duct, at which time an operation on the biliary tract would be urgent, her hyperthyroidism would greatly complicate the situation. In this case partial thyroidectomy is not only advisable but urgent.

In case four we have again a case of apparently a single adenoma, but the rate is not so high, +30 per cent. There is no question about the hyperthyroidism, but it is moderate in form. This patient, in order to get well, must have the adenoma removed.

Some observers believe that exophthalmic goiter and adenomatous goiter with hyperthyroidism are the same disease, differing only in that adenomatous goiter with hyperthyroidism is a late phase of the former. No convincing evidence has ever been offered in proof. I am convinced that adenomatous goiter with hyperthyroidism constitutes a distinct clinical entity. The symptoms of adenomatous goiter are confined to the manifestations of pure hyperthyroidism, or increased oxidation processes, whereas the patients with exophthalmic goiter commonly present additional symptoms; the nervous syndrome, ocular signs, and gastro-intestinal crises of nausea, vomiting and diarrhea. Pathologically they differ. In exophthalmic goiter the entire gland is diffusely hypertrophied, whereas in adenomatous goiter with hyperthyroidism the gland may be affected only in part, as in this case. The differences in the results of operation are most convincing that the two conditions are not the same. Recurrence of symptoms of hyperthyroidism after subtotal thyroidectomy for exophthalmic goiter are not uncommon; the incidence is from two to five per cent of almost every series of cases, whereas recurrence of hyperthyroidism following removal of adenomatous goiter is exceedingly uncommon.

The lady of case five has a similar condition, nothing unusual except that it happens to involve both lobes of the thyroid gland. The condition is more prominent on the left, but there is also evidence of the disease on the right.

Just a point about palpating the thyroid gland. I have seen physicians feel it in this way; that is, palpate the neck as one would palpate the abdomen. I think the proper way is to stand in front of the patient and palpate one lobe at a time. With the thumb of the right hand, the left lobe of the thyroid gland is pushed to the right; then, with the fingers of the left hand pushed in behind the sternomastoid muscle, and the thumb in front mesial to it, so that the sternomastoid muscle lies almost in the palm of the hand, the right lobe of the thyroid gland will lie between the fingers and the thumb, so that its entire cervical portion can be readily palpated during the act of swallowing. To palpate the left lobe, the right lobe is pushed to the left and the left lobe is grasped in a similar manner.

Case VI: Adenomatous Goiter; Auricular Fibrillation. (Dr. C. J. Meredith).

Mrs. S. H., aged 69, states that her mother and sister had goiters but were not operated upon. The patient's goiter has been present for fifty years. For fifteen years she has had palpitation and dyspnea. Five years ago her heart became decompensated for the first time; she had a second attack one year later, and another in April, 1931. The last attack was the most severe and was accompanied by ascites, enlargement of the liver and marked fibrillation. She was treated with salyrgan and digitalis and the heart regained compensation.

When first seen, June 25, 1931, examination revealed a very large, bilateral adenomatous goiter, which was hard and nodular and extended slightly below the sternum and upward to the angle of the mandible. There was marked fibrillation of the heart but no edema or enlargement of the liver.

She was placed on digitalis, 20-25 minims three times a day and a two-stage operation was performed in 1931. Since that time her condition has been markedly improved. She has no dyspnea except on sudden exertion, feels well and does all her own work. She has not taken digitalis for eighteen months. Her heart is slightly irregular but she has no edema of the feet and no liver enlargement. She has gained thirty-six pounds. Her systolic blood pressure has been reduced from 174 to 152.

Dr. Pemberton: This is a brilliant result of operation. This patient, with heart failure, congested liver, and ascites was operated on and now she has been perfectly restored to the condition in which she was before the growth occurred. She has no evidence of hyperthyroidism, and I think we may assume that the result of the injury she sustained has already come to a standstill. From her history, I think the operation was very wise.

Before we employed iodine, we were in the dark. We felt there was an unknown risk in practically all cases of exophthalmic goiter, and to be on the safe side we employed an operation in stages in most of these cases. I am certain that

this was the right thing to do in the light of our knowledge at that time, but I am also certain that we subjected many patients to operations in stages when this was not necessary. With the aid of iodine we have kept many patients from a post-operative explosion. Today we can say that not more than two to four per cent of the patients with goiter actually need multiple operations. The indications for an operation in stages are definite. There are patients with hyperthyroidism of high grade, who have a large, hard gland which makes the operation difficult. The condition of some of these patients cannot be greatly improved by treatment with iodine. By resecting a lobe at a time in such cases we definitely reduce the risk; if for no other reason, we diminish the chance of having technical complications. The two complications we are most likely to see are injury to the laryngeal nerve and hemorrhage. It has been my experience in operating in severe cases, in which the threshold of safety is very narrow, that if the operation can be carried out without a technical complication the patient probably will endure it, but if there is a nerve injury, or another technical complication, the patient may not get well. In lobectomy the chance of injury is just half that of a double operation. If the surgeon waits several months, until the patient gets back on her feet, and then does the second operation, the risk is entirely different. Then if the laryngeal nerve is injured, or if the patient has a hemorrhage, it will not necessarily have the same influence as if it had occurred when the patient was in poor condition.

The end result in this case is striking and most gratifying. The patient has no hypertension and Dr. Meredith tells me she has no cardiac lesion.

As to the question of preparing for operation patients with adenomatous goiter with hyperthyroidism, I first wish to speak about iodine. We use iodine in all cases of hyperthyroidism in preparation for operation. It has been our experience, however, that while patients with toxic adenomas may improve markedly, it is the rule that the benefit obtained is not as great or as constant in cases of exophthalmic goiter. However, I have seen cases of toxic goiter in which improvement has been as marked as it has been in exophthalmic goiter. We use iodine not only because we want to cause the improvement, if possible, but also on the chance that we are dealing with an exophthalmic goiter; here, of course, the assistance of iodine is absolutely necessary to prevent unexpected untoward complications. Post-operative administration of iodine cannot be depended on to combat the exophthalmic goiter after operation. In our earlier experience with iodine, I can recall a case in which the diagnosis was adenomatous goiter with hyperthyroidism, and in which iodine was not given before operation. At operation the goiter proved to be diffusely hypertrophied (exophthalmic goiter) and after operation iodine was given to the limit, but this failed to prevent or control the post-operative hyperthyroid reaction.

Case VII: Dr. William Campbell: Mrs. J. T. A., aged 29, has an irrelevant family history. She complains of nervousness, crying spells, shortness of breath, palpitation on exertion and of tiring easily. She also states that she perspires easily and is intolerant to heat.

A swelling in her neck was first noticed about five years ago, and her eyes became noticeably prominent about four years ago. She has a voracious appetite, craves sweets and drinks large quantities of water between meals. She first noticed the shortness of breath and palpitation about six years ago, following her first pregnancy. Her ankles are swollen in the evening, but are normal in the morning. She states that in February and March she had crying spells which would last for three or four hours at a time, without any adequate cause. She sleeps well and has gained nine pounds during the past year.

Examination shows a definite exophthalmos; the pupils are equal, react to light and accommodation and there is no nystagmus. The skin is moist. There is a distinct tremor. The tonsils have been removed. The thyroid gland is uniformly enlarged, but no nodules are palpable. There is no apparent enlargement of the heart, no arrhythmia. The pulse is 104, regular. The basal metabolic rate is +8 per cent.

Dr. Pemberton: The thyroid gland of this patient is not very large, but she has ocular symptoms; that is, slight exophthalmos and definite widening of the fissure. I think there is no question of the diagnosis of exophthalmic goiter. She is intolerant to heat, has a rapid pulse, and other symptoms. It is possible that the hyperthyroidism of this patient could be fairly well controlled by iodine.

Concerning exophthalmic goiter there is an opinion that all surgeons do not hold, but it is true nevertheless, that patients with exophthalmic goiter have a tendency to get well. I think if this tendency did not exist we would not get far with any known treatment. Unfortunately, we have no series of well controlled cases in which the basal metabolic rate has been determined, and pulse rate and blood pressure have been

recorded over a long period. Some years ago, Kessell, Loeb and Hyman reported a series of cases of exophthalmic goiter in which no treatment other than supportive measures and iodine was employed. They stated that their results were as good as in any series of cases in which roentgenotherapy or operation had been employed. Twenty-two months after the first of their patients had come under observation, the average basal metabolic rate was about +18 per cent. On this basis they had made their claim, but further analysis of their data revealed that 10 per cent of their patients had died, an exceedingly high mortality rate. Frazer, of London, reported a series of cases of exophthalmic goiter in which medical measures had been applied with the patients in hospital; from five to ten years later 25 per cent of the patients were dead.

I do not doubt that many patients with exophthalmic goiter would get well if they were left alone or treated symptomatically, because this is the tendency of the disease, but I think there will be a number of cases of chronic invalidism and a very high mortality rate.

If we compare the available data on patients treated medically with our data on patients treated surgically, it will be seen that after the lapse of five years the mortality rate among those treated medically is many times higher than that among those treated surgically.

Case VIII: Exophthalmic Goiter. (Dr. C. J. Meredith)

Miss L. H., aged 16, has always been nervous, has a voracious appetite, sleeps well but has been losing weight (twelve pounds in three months).

When first seen, August 29, 1932, examination showed that the tonsils were infected, the pulse rapid and bounding, the skin moist. There were no eye symptoms, but a fine tremor of the hands was observed and a slight diffuse enlargement of the thyroid. A basal metabolism test was refused. Blood pressure: Systolic, 130, diastolic, 60; pulse, 118.

When seen on December 6, 1932, she felt well but was restless, the tremor of the hands persisted and there was a systolic murmur over the apex. Her weight was 110, a gain of ten pounds. On May 19, 1933, her weight remained the same, she felt well, had done well in school, had no eye symptoms and complained of no heat intolerance. The blood pressure was systolic, 130, diastolic, 60; pulse, 110. The basal metabolic rate was +12. There was no quadriceps weakness.

Dr. Pemberton: I cannot feel any enlargement of the thyroid gland of this patient. It is a question whether, when she was first under observation, she had exophthalmic goiter. The history is suggestive, but I would feel that even now, with a rate of +12 per cent I could not be sure of the diagnosis.

There are cases of nervous exhaustion which are almost impossible to distinguish clinically from cases of exophthalmic goiter, without careful examination, and I think a valuable aid in the determination would be to study this patient now, before she had been given iodine, and then to give her iodine for ten days to two weeks and note the effect on her general condition and on the basal metabolic rate. Without such a test, there are not sufficient symptoms to warrant operation.

I wish to say a few words about the effect on the patient of the operation for exophthalmic goiter. Our conception of exophthalmic goiter is that an unknown stimulus, acting on the entire thyroid gland, drives it to the point of diffuse hypertrophy. This results in production of an excessive amount of secretion, which, when in the tissues of the body, causes all the phenomena of the disease. These phenomena may be divided into two groups: (1) Those which are the direct result of increased metabolism or oxidation processes, such as the cardiovascular changes, intolerance to heat, increased sweating, increased appetite and loss of weight and strength, and (2) additional symptoms that are sometimes present, such as peculiar nervous phenomena, gastrointestinal crises of nausea and vomiting, and exophthalmos and other ocular changes. The first group of symptoms is the result of pure hyperthyroidism and can be produced experimentally by continued feeding, to normal or myxedematous patients, of thyroxin or thyroid extract. According to Plummer's conception of the disease, the thyroid gland produces two products, one normal and one abnormal, and the second group of symptoms is the result of the abnormal secretion.

In a small percentage of cases, after subtotal thyroidectomy, hyperthyroidism persists or hyperthyroidism subsequently recurs, and it is because of this tendency, in a small group of patients, that in recent years certain observers have advocated an extremely radical operation in order to avoid recurrences. I wish to say that I do not believe there is any good reason to expect that a radical operation, in which only tags of tissue are left in order to produce hypothyroidism, will obtain better end-results than the more conservative operation in which thyroid tissue equivalent to a sixth or a fourth of a lobe of normal size is preserved on each side. Furthermore, I am convinced that the radical operation entails

a very much greater risk of technical complications, such as production of tetany, and injury to the recurrent laryngeal nerve, than the more conservative operation in which these complications can be practically avoided. It seems to me, therefore, that the occasional complication of tetany, and the greater likelihood of injury to the nerve, constitute too high a price to pay for the radical operation, which in reality does not provide any greater insurance against recurrence of the disease than the more conservative and safer operation.

Those who advocate radical operation have done so on the ground that recurrence of the disease is entirely dependent on the fact that too much tissue was left at the first operation. If a large series of cases of recurrent exophthalmic goiter is analyzed it is found that recurrence of symptoms has developed after lapse of a long time. In a series of 100 cases which I analyzed, the average period was four and a half years, and the longest, twenty years. Is it reasonable to believe in such a case that if twenty years previously a more radical operation had been performed, recurrence of the disease could have been prevented?

From the clinical records of a large group of patients with exophthalmic goiter, it is apparent that the course of the disease, in a large majority of the cases, proceeds in waves of intensity, with intervening periods of partial and sometimes complete remission. Since the size of the thyroid gland remains relatively the same, the fluctuating course seems to be caused by difference in the intensity of the stimulus on the gland, rather than by any marked variability in the gland itself. There is much evidence to indicate that there is a tendency for the stimulus, or force, that causes exophthalmic goiter to abate or completely to disappear in a large majority of cases. In a small percentage of cases of exophthalmic goiter, a spontaneous, complete and permanent remission of symptoms sometimes occurs. The reason that more patients do not recover spontaneously is probably that although active stimulation of the gland has abated, the very bulk of the gland accounts for the excessive secretion.

Complete and permanent remission of symptoms occurs in a very large percentage of cases (more than 90 per cent) following subtotal thyroidectomy, in which an appreciable, although variable, amount of viable glandular tissue is preserved. Since symptoms of exophthalmic goiter can recur following operation on patients in whom a very small amount of thyroid tissue was preserved, it would seem reasonable to believe that the recurrence after subtotal thyroidectomy is due more to recurrence of the stimuli or forces that produce exophthalmic goiter than to the amount of tissue preserved at operation.

The
JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA, *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

North Dakota State Medical Association
South Dakota State Medical Association
The Hennepin County Medical Society
The Minnesota Academy of Medicine
The Soo Railway Surgical Association
The Sioux Valley Medical Association
North Dakota State Health Officers' Assn.
Great Northern Railway Surgeons' Assn.
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M. E. Herz, *Business Manager*
84 South Tenth Street, Minneapolis, Minnesota

W. L. Klein, 1851-1931

MINNEAPOLIS, MINN., MARCH 1, 1934

JOURNAL-LANCET WIDENS ITS FIELD

The publishers and members of the Editorial Board are desirous of having the JOURNAL-LANCET render the greatest possible service to all of its readers. It is not our desire to encroach upon any field or organization already adequately supplied by an official publication. At no time have we presented a proposition to any organization the LANCET does not already serve unless solicited by one or more officers of the organization. We prefer, in addition to our present activities, to find niches into which the LANCET can fit without interfering in any way with other medical publications.

For some time the publishers and members of the Editorial Board have considered widening the scope of the JOURNAL-LANCET and, in fact, have published occasional special numbers written by national and international authorities both in this country and abroad, for example, numbers devoted to proctology, disease of the thyroid, and syphilis. These numbers are not published with the idea of competing with special journals in these fields but rather to bring to our readers, many of whom do not subscribe to all of the special journals, the most modern information in diagnosis, treatment, and prevention, in such a way that the material may be used in their everyday practice. During the year, 1934, several special numbers are scheduled to appear. Most of the papers for these numbers are being prepared especially for the LANCET.

With a broadened field of activity, the value of the JOURNAL-LANCET to the general practitioner is greatly increased since the material presented represents a digest of the subject in a compact and semi-permanent form. The fact that the LANCET is a periodical will insure the timeliness of the papers presented. J. A. M.

BEWARE OF THE TRICHINA SANDWICH

Since the "Century of Progress" disseminated some of its exhibits throughout the land, there have been outbreaks not only of dysentery but also of amebaphobia.

After struggling with the problem of how to control the disease-carrying food handlers, attention is now being turned to the disease-carrying foods. People are asking what is safe to eat.

A bulletin of the state board of health says that "recent post-mortem examinations have shown, by the presence in muscular tissue of the hard capsules in which the trichina encloses itself, that many more people than formerly have been infected at some time or other" by that parasite.

It is doubtless right to assume that this increase may be due to the present popularity of the hamburger sandwich which is made from a combination of beef and pork. Trichina infestation is found principally in pork and this should be more than heated and browned before it is eaten. In as much as thorough cooking is

complete protection against this nematode of the hog, the remedy is obvious, but a little education and repetition now and then is necessary never-the-less. Forgetfulness is such a common trait.

A. E. H.

MISMATING

In their intimate knowledge of family life, physicians become aware of the existence of many unhappy marriages. They usually see some phase of every case that goes to divorcement and many others that never reach that decisive stage. It is interesting to note how different peoples, societies and creeds endeavor to make the unions binding; some by ceremonies and rites that are long and impressive with canons and injunctions against separation, while others use the simplest language imaginable.

The Baha'i religion which boasts some 5,000 adherents to its faith in this country, has no priesthood, and a friend reads the service; first to the groom: "The man must consider the woman of his choice as the partner for the period of his existence." Then to the bride: "The intellectual and spiritual ideals of the woman must be in harmony with those of the man," and all chant together their approval.

It is certainly desirable that there should be an agreement on fundamentals. If such simple tests were applied, and expressions of mutual understanding preceded every marriage, they might be more lasting. A striking sentence from the pen of Charles Dickens comes to mind: "There is no disparity in married life like unsuitability of mind and purpose."

A. E. H.

DOCTORS AND THEIR AVOCATIONS

A very recent book* is made up of concise stories of the lives of doctors who achieved distinction in other fields of activity than medicine. It may be both interesting and profitable to spend a few moments in examining the list and citing a few examples. We shall find some surprises.

Among famous English writers who were physicians we find Keats (1798-1821), Oliver Goldsmith (1728-1774), Sir Thomas Browne (1605-1682), Sir Arthur Conan Doyle (1859-1930), Samuel Smiles (1812-1904), and Tobias Smollett (1721-1771). Thomas Bowdler (1754-1823) was a physician who directed his literary urge into the channel of expurgating the works of the masters. In 1818 he published "The Family Shakespeare in ten volumes, in which nothing is added to the original text; but those words and expressions are omitted which cannot with propiety be read aloud in a family." He also "purified" Gibbon's *History*. Thus the expression "to bowdlerize" came into being. Among noted Americans we find Oliver Wendell Holmes, S. Weir Mitchell and William James. Peter Mark Roget (1779-1869) devoted the later years of his life to the compilation of his well-known Thesaurus of English Words and Phrases (1852), a collection of synonyms which went through 28 editions in his lifetime and is still in active use. Schiller was originally an army surgeon and Goethe studied the basic sciences and made original contributions therein.

In the field of invention we find Joseph Ignace Guillotin (1738-1814) and Richard Jordan Gatling (1818-1903), both men of humane instincts, but whose names will always be attached to the instruments of death which they devised.[1] John Gorrie (1803-1855) originated the first machine for making artificial ice. Among English physician-inventors are Nicholas Barbon (d. 1698), son of Praise-God Barebones, originator of fire insurance, Timothy Bright (1551-1615), the inventor of modern shorthand, Charles Brooke (1804-1879), who invented self-recording instruments (thermometers, barometers, etc.), George Borlase Shields (1816-1888), for over 40 years surgeon to the city of London Police, introduced (in 1861) the modern police helmet, Henry Faulds (1844-1930), inventor of the finger print method of identification, often wrongly credited to Bertillon whose method was based on comparative measurements. Sir Goldsworthy Gurney (1793-1875) practiced surgery for a few years and then retired to devote his time to invention, mostly in the field of locomotion. He invented the oxyhydrogen blowpipe and the steam jet, besides suggesting many important improvements in lighting, sewerage and ventilating systems. Charles Morrison (fl. 1753) was the first inventor of the electric telegraph. Alfred Smee (1818-1877) made notable researches in chemistry and electro-metallurgy, inventing the Smee battery, inventing permanent ink and perfecting the present system of printing checks and bank notes, improving the latter so that they could not be split. James Syme (1799-1870), well known surgeon, devised a process of dissolving rubber in naphtha for the purpose of rendering clothing impervious to water and published an account of it five years before that of Macintosh, who took out a patent and received all the credit.

In the field of poetry medicine is fairly well represented, but not so with art or music. Seymour Haden (1818-1910) the etcher, was a surgeon in active practice and Borodin (1834-1887)

the famous Russian composer, stands alone in music. On the other hand, "among canonized saints, according to Fletcher, there are forty who are said to have been physicians and three of the popes are entitled to the same distinction, viz. John XXII, Paul II and Nicholas V." A few who were well known pirates and criminals have been given place in the Dictionary of National Biography. In other spheres of activity we occasionally find the name of a wellknown man who was also a physician.

The foregoing excerpts from this interesting book can give but an outline of the whole, for space does not permit of more and only those who are no longer living have been mentioned. The book itself must be read to be appreciated and it can be cordially recommended.

*The Physician as Man of Letters, Science and Action, by Thomas Kirkpatrick Monro, M.A., M.D., Regius Professor of Medicine in the University of Glasgow. Pub., Jackson, Wylie & Co., Glasgow, 1933.

1. The late Dr. A. D. Rockwell of New York, himself opposed to the death penalty, invented the electric chair and execution by lethal gas was also first proposed by physicians.

G. C.

Proceedings of the Minneapolis Clinical Club

Regular Monthly Meeting, January 11, 1934

President, Dr. H. Bright Dornblaser, Presiding.

Senior Program Arranged by Dr. T. A. Peppard
Dr. F. W. Wittich, Presiding.

ADVENTURES IN BRONCHOSCOPY

Dr. K. A. Phelps

I WANT first to make an apology for not having an organized paper to present. Between the time Dr. Peppard spoke to me about it and now, I have been away and have not had an opportunity to write up anything very definite on this subject. I have decided, with your permission, not to discuss "Adventures in Bronchoscopy", but to go back to the old standby of men in the bronchoscopic field and present a series of slides showing foreign bodies in the air or food passages.

First of all, I prepared a little chart this afternoon based on my group of 337 cases of foreign bodies which brings out a few interesting features about them. In the first place, the number of adults, (112) compared to the number of children, (225). There are twice as many in children as in adults and of these, there are many more in the air passages, (130), than in the esophagus, (95). In the adult series 101 are in the food passages to 11 in the air passages. That means that foreign bodies in the adult are usually food. They have to do with eating, a bit of bone or some fault in the preparation of the food, whereas children rarely get foreign bodies from food. Their food is carefully prepared, they are watched while eating, but between meals they get hold of something else, wherever it might be, and get it into either their food or air passage. The location of these foreign bodies, therefore, in the adult, is mostly in the esophagus and in children a little more commonly in the air passage than in the food passage.

The number of cases of foreign bodies in the larynx is comparatively low, ten cases out of 337 and this means positive foreign body cases. I did not include a case where a child swallowed a penny and it went into the stomach nor did I include cases where there was a suspicion of a foreign body but none found. These are cases of actually proven foreign bodies.

(Presentation of lantern slides)

Slide: This shows a type of foreign body which we do not commonly see, an unknown foreign body. This boy was an interne in a hospital and had a routine x-ray of his chest. This ring was found in his esophagus. He did not know where it came from, how long it had been there and was not particularly anxious to have it removed, so it is still there.

Slide: This is a foreign body in the esophagus, the most common in children, a coin. You know it is in the esophagus because of the axis in which it lies.

Slide: This is another foreign body, in the opposite plane, caught just at the upper edge of the larynx.

Slide: This shows a coin but here you notice there is a little trouble in the lung. This child was sent down on account of a stricture but when we saw the foreign body we wondered if it was not the foreign body, which was unsuspected, that caused the obstruction. A further x-ray study was made which shows a multiple stricture of the esophagus. This child died a month later and a tumor in the mediastinum was found here, a performation of the esophagus here into the mediastinum and directly into the lung itself, so

a simple foreign body prospect turns out to be quite a different thing.

Slide: This shows a jack in the esophagus. This child had a wry-neck and a plate was made looking for some lesion of the vertebra to account for the wry-neck. This is an esophageal foreign body and holding the head to one side is a symptom produced by the foreign body.

Slide: Another foreign body in the esophagus, a needle lying across here. This patient was unable to swallow. Thinking the needle was all that was all that was there, we were surprised to find not only the threaded needle but a very large amount of toilet tissue. This girl was an inmate of an epileptic hospital and the kind that eats most anything that comes long.

Slide: This slide shows a partial dental plate in the bronchus. The oldest patient, age 74, with a foreign body, that I have ever seen.

Slide: This also is a dental plate in the esophagus. This man was reading, fell asleep in his chair, and his plate fell into the esophagus.

Slide: A multiple foreign body, a safety pin and, if you will look sharpely, you will see the head of a safety pin in the stomach as well as in the esophagus. It was wide open and pointing upward.

Slide: Another foreign body, a staple which had been swallowed. This plate was taken immediately and the diagnosis of foreign body in the stomach was made. After about seven weeks it was still there and we decided to do an external operation and remove it but the surgeon could not locate it. He palpated the stomach, the entire intestinal tract, but found no foreign body. He took another plate and you will see where the foreign body was. It had been vomited almost out of the esophagus during the anesthesia.

Slide: An organic foreign body, a bit of meat which has obstructed the lower end of the esophagus. There was some question as to whether that was merely a foreign body or an obstruction as cancer, etc.

Slide: A foreign body in the trachea. This is easily seen, the bifurcation being here. It stopped at the bifurcation. Inorganic foreign bodies occur in the trachea also. One point in the diagnosis of that from the x-ray is the measurement of the heart diameter in which it is just the opposite at expiration and inspiration from the normal length of the heart shadow. This was a grain of corn.

Slide: An opaque foreign body, a nail with a curve which goes around from the trachea into the bronchus. You can see how the air in that obstructed lung is trapped. It can get in but it cannot get out. There is much more air in the obstructed lung than in the non-obstructed lung.

Slide: This is a prune-pit in the bronchus.

Slide: This shows the same condition only in this case the very definite difference at the two phases of respiration. The air can get in but cannot get out. The picture on the right looks like a normal chest and the one on this side shows a very marked difference in the two sides. Those plates were taken within a second or so of each other, just inspiration and expiration.

Slide: This slide shows the same condition, expiration and inspiration, a very marked difference in these two plates. One can see that beautifully with the fluoroscope and watch the mediastinum shift from side to side.

Slide: In this the condition is the same only we removed the foreign body from the side opposite from where we expected to find it, the explanation being that it had been coughed up into the trachea and dropped down into the other bronchus.

Slide: A bilateral obstruction due to two foreign bodies,—each bronchi had a piece of a peanut in it. That complicated the diagnosis. Dr. Allison said there was nothing or something in both sides. The next morning this picture was taken which shows a little change and he thought there was some obstruction.

Slide: This is a partial emphysema, one portion of the lung, the upper lobe, being non-obstructed and the lower two-thirds being obstructed.

Slide: This shows a similar condition, obstruction of the bronchus, but this little shadow bothered us even after the removal of the foreign body, when it was still present .The next plate was taken sometime later and a diagnosis of thymus made.

Slide: A condition different from any of the others, is shown here, beginning complete obstruction, filling up of the bronchi with secretions, beginning atelectasis, and at the same time there is enough obstruction in the remaining lung to produce emphysema.

Slide: The same sort of thing on the opposite side, beginning obstruction below here with atelectasis and a probable emphysema of that same lung.

Slide: This is an atelectasis, early complete, without any air getting into that obstructed side. In the others, the air could get in but could not get out. This plate was made within twelve hours, I am sure, of the time of the aspiration of the bean.

Slide: A beginning atelectasis from an opaque foreign body.

Slide: A beginning atelectasis which at first was not thought to mean anything although the history of foreign body was quite definite. A plate made later shows a progression of this atelectasis, more secretions behind the obstruction, and then the diagnosis was made.

Slide: This shows an atelectasis, one lung being completely obstructed.

Slide: This is a similar condition, an atelectasis or a beginning drowned lung of the lower lobe on that side. We were a little uncertain, put the child in the hospital, and he coughed out the foreign body.

Slide: A peanut present for three weeks. I put this one in to show that a peanut may not be so fatal if present a little while.

Slide: A peanut present for three months. A diagnosis had not been made and the child did not seem to be toxic. I do not think it is the toxin of the peanut so much as it is the degree of obstruction that makes peanuts such dangerous foreign bodies.

Slide: This is a watermelon seed which has been present for a couple of years. It had produced very little change. It had been bouncing around. After two years presence there was a little obstruction on one side and then here you see the same youngster after removal forty-eight hours later.

Slide: A foreign body which had been present eleven years. That youngster had all the symptoms of advanced pulmonary sepsis, club fingers, loss in weight, etc. This was a very hard foreign body to get at. I could not get it out; he was taken to Rochester and they could not get it out, and at postmortem the pathologist could ge it out only with considerable difficulty. There are occasions when foreign bodies are impossible to remove.

Slide: This shows a foreign body present for thirteen years with comparatively little reaction. It isn't necessarily the length of time the foreign body is present, it is the amount of obstruction produced that is important.

Slide: The foreign body had been located here and if you will look at this next slide, the anterior posterior view, you will see how completely that lung is filled. It is a lung abscess and yet it is not pneumonia. We do not see pneumonia very often as a complication of foreign body.

Slide: A apple stem. The lung is full of pus and on uncorking the bronchus it just pours out.

Slide: This slide shows the same sort of a thing, only due to a different cause. A tooth was knocked out by a mouth-gag during a tonsillectomy and a post-tonsillectomy abscess was considered until the tooth was discovered. This child had really a gangrene of the lung.

Slide: This shows a small rivet with the head up.

Slide: This is the same case, showing the head of the rivet down, meaning that it was floating in a cavity in the lung. The child improved after removal although it took months for it to clear up.

Slide: This case was a small baby, less than a year old, and in order to get the forceps jaws to expand and get by the foreign body far enough to have a grip on it, we probably cracked a bronchus and the next plate will show what happened.

Slide: A generalized subcutaneous emphysema. No serious symptoms developed and the baby recovered promptly.

Slide: This was a case in which bronchiectasis developed as a complication of a foreign body. There was so much secretion that the child could not get enough air. We did a tracheotomy for drainage.

Slide: This shows the complication of a ruptured bronchus and there you see the collapsed lung, a pneumothorax.

Slide: This shows another complication and a rare one, a pleurisy. The foreign body was removed and the pleurisy disappeared.

DISCUSSION

Dr. Leo G. Rigler—This series presented by Dr. Phelps certainly represents a most unusual, interesting, and fascinatingly presented group. There is nothing more satisfactory, either to the roentgenologist or the bronchoscopist, than a foreign body case, because, in most cases, if you have a reasonably good knowledge of the findings, a good diagnosis can be made, and the results of therapy are brilliant.

There is one case Dr. Phelps did not mention which rather sticks in my mind as it was rather dramatic, and unfortunate, too. Some years ago a boy came to the University Hospital, after he had aspirated a ball-bearing down his right lower bronchus. It had only been there a short time. We put him under the fluoroscope and I could see that ball-bearing bounce back and forth from the lower portion of the right lower bronchus, right up the trachea until it hit the larynx. It acted just like a ball going down a bowling alley. With each cough, this motion took place. One of the younger men had what he thought was a brilliant idea, thinking that because the ball

If you do get enthusiastic about this, don't forget to keep the patients' joints in functional position and it will, at least, prevent deformity because by the time they do get up and around they must have functional position of the joints.

Dr. M. O. Henry: I would like to compliment and congratulate Dr. Schaaf on his presentation tonight. I feel that this work in vaccine therapy, while it has all been good, may lead to a veritable "racket." I am very glad to have heard this presentation.

Dr. Erling Hansen: I do not feel competent to discuss this subject at all. Of course it is a thing we have been more or less interested in from the standpoint of focal infection and this has been, as Dr. Schaaf intimated, in a large number of cases, the removal of foci such as tonsils. In the literature now there are quite a few tables which have been prepared by careful observers covering a good many hundreds of cases where tonsillectomies have been done, and showing that the results, for the most part, have been rather disappointing in the great run of cases of rheumatism. I have had some which have been very satisfactory and they are probably the cases which have been chronic infectious arthritis with the tonsils as the focus.

I can think of a couple of cases which were quite miraculous, and have stayed well; one, a bedridden man who had been in the hospital with a number of affected joints for several months, who cleared up almost immediately after removal of the focus in spite of the severity of his condition. The other type of case that Dr. Schaaf has spoken of where they have everything done for them without any permanent results, I think probably have a different etiology. In the one group the question of frank infection, I am sure, does enter into it

Also, not from the arthritic standpoint, but in the etiology of iritis in the so-called rheumatic case, Benedict and Rosenow's work on the infections and Rosenow's findings in regard to the cultural characteristics in the bacteria that were found, the similarity of those characteristics in the joints and iris tissue and clearing up simultaneously these lesions, is rather interesting. I think it is in that type that we have had our chief interest; that we had our chief interest, and that we had our real results. The other cases have been very disappointing.

Dr. Walter H. Fink: I wish to stress the danger of using this therapy in cases not physically fit, particularly in eye cases. I believe it is a mistake to use it in very old people.

I have had occasion to see a few cases where this therapy was used but no results were obtained until the foci of infection was removed.

Dr. Leo Rigler: I had something to do with Dr. Wetherby's work, so I feel it is my duty to rise in his defense. I do not want to disagree with the general trend of Dr. Schaaf's paper. I may say that I have had a rather disagreeable case of arthritis myself, and I have not taken vaccine because I am not entirely convinced of its efficacy; nevertheless I should like to call your attention to a few points, which should be corrected.

I think no one should doubt the fact that Dr. Clawson found streptococci in the blood of these patients. It seems to me that there is more question as to Dawson's work and no one has cast any reflection on the character of Dr. Clawson's work in the past, or at the present. The only mistake that might be assigned to Clawson was brought out very recently in a paper by Dr. Gross and his associates. They showed that streptococci were frequently found in the blood cultures of sick people. This, no doubt, is true, and I believe that Dr. Clawson feels that the only mistake they have made was in using fairly normal people for controls, instead of using sick people.

As far as the classification of arthritis is concerned, I think Wetherby's and Clawson's work has been of great value. I had a considerable personal experience with that. Shapiro brought this up first, citing the work of Nichols and Richardson, who claim that on a pathological basis, it was almost impossible to distinguish the various forms of arthritis. They found that in a large group of cases, removal of the joints and microscopic examination even, did not enable them to distinguish, for example, between a gonorrheal arthritis and an atrophic one. At the time I disagreed radically with this idea, but I had no real basis for it. In an attempt to settle the matter, we took 60 consecutive cases from the outpatient department, the only selection being that we took cases with polyarticular arthritis. In these, we examined all the joints in which there were any symptoms of a reasonable degree to suggest involvement; counting the joints of the fingers and the toes as one joint, we nevertheless, examined something over 500 joints in these sixty patients which means an average of almost nine joints to the patient. These had roentgen examinations, and we attempted to classify them on the basis that we used in the past. We found that there were so many cases in which there was a mixture of types, that it was almost impossible to distinguish any particular picture as representing consistently any particular type. We found, in

fact, a much greater correlation between the age of the patient and the particular type of arthritis, and the particular joint involved and the type of arthritis, than we did between the symptoms and the type of arthritis, or the type of patient and the type of arthritis. Almost always, with the older individuals, we had the hypertrophic type. Those individuals who had it for a long time showed a mixed type, etc.

It seems to me that the work of Wetherby and Clawson should still be considered very seriously, and that there is a good deal to be said for it. So far as a careful examination is concerned, I must say, that in the cases that we have seen from the Out-Patient Department, most of them have been X-rayed and very vigorous attempt has been made to rule out other lesions. I must also say that I have never heard him call this vaccine a cure. I believe I have heard him talk on this subject any number of times and we have discussed it personally very frequently, and all I have ever heard is that it was expected to secure either a remission or a marked modification in the course of the disease.

This, no doubt, is the most that anyone had the right to claim for it and it is my distinct impression that they had no intention of claiming any more.

In so far as the agglutination titer is concerned, I believe there is considerable evidence of good character, that there is a distinct correlation between the agglutination titer and the symptoms of the patient. I have seen a few of these cases personally, and it is startling to see the striking increase in the titer as the symptoms of the patient improve under vaccine therapy.

Those are the only points I had in mind. I think an error has been made in elaborating the importance of this work and perhaps in speaking of it too enthusiastically, but at the same time, I think there was a real sincere feeling in the minds of the people doing this that they had something that was worth while. They may have made some mistakes in judgment by being too enthusiastic, but at the same time there was a good foundation at the beginning at least, for the beliefs they had.

Dr. Norman Johnson: I have an incident which might be worth reporting. This is a case of a woman of about fifty years of age who has very distressing arthritis of the atrophic type, decided ankylosis, etc., and has been under various forms of therapy. She demanded Wetherby's serum and got it, with some relief from pain. It was given to her in the spring of 1932. That summer she developed, for the first time in her life, asthma. That asthma has become gradually worse in spite of bilateral radical sinus operations and she is now, or was when I saw her last, departing this city for Arizona. She is convinced that the serum did it. The only allergic sensitivity to be found is based on suspicion rather than well demonstrated fact. There is no familial history of any allergy until you get back to the grandparents. I, myself, could make no decision as to whether there was any cause and effect relationship as to the use of the foreign protein, and the asthma. I offer it as something to be considered.

Having seen such cases of asthma develop before, when the patients have not had any form of Wetherby's or Cecil's serum, it is quite possible there is no connection, but in the patient's mind there is a definite connection.

Dr. R. G. Allison presented a series of X-ray plates illustrating intravenous pyelography.

Discussion

Dr. H. M. N. Wynne: This has been a very delightful demonstration. Sometimes intravenous urography shows congenital anomalies which are shown with difficulty by the retrograde method.

I was sorry that Dr. Allison did not have more retrograde pyelograms in these same patients for comparison. There is no doubt that intravenous urography is a great help in diagnosis for the internist and surgeon and it is one of the greatest advances in urology in recent years.

Dr. E. W. Exley: At first some urologists were inclined to look at intravenous urography with some apprehension. I think that by now it is agreed that it brings to light more genito-urinary pathology with a larger amount of work as a result of its use. Probably the greatest objection to the intravenous method is the failure of visualization of the finer anatomic details and I do not think there is any doubt that these are not brought out in the average case. Along this line, while an occasional brilliant diagnosis can be made in early tuberculosis or an early tumor, in the majority of cases they will be missed as a result of intravenous study, and the patient will lose his chance by not having early treatment.

Another disadvantage is that it is subject to gross error in the evaluation of renal function. While prompt visualization is invariable indicative of normal renal function, delayed visualization is indicative of diminished function with some obstruction. Absence of vizualization does not mean absence of function. Its use in the localization of shadows is most advantageous.

Anomalies of the bladder, ureter or kidney are

very well demonstrated. It is excellent for use in most children, the difficulty being in the technical administration of the solution. In trauma I think most men agree it is valuable in about 50 per cent. Some kidneys, when traumatized, do not excrete any of the solution.

Contraindications are in markedly debilitated patients, patients with marked renal insufficiency from any cause, hypertension patients and in patients who have an idiosyncrasy to iodine. An idiosyncrasy to iodine usually is not known until after you have given the solution.

I think one must conclude from these remarks that we can rely on intravenous urography and in those doubtful cases that combined with the retrograde method this makes a very admirable procedure and a valuable adjunct in urologic diagnosis.

Discussion of Dr. Allison's Remarks

By Dr. S. R. Maxeiner

The young man referred to by Dr. Allison is particularly interesting to us in this respect, namely that we operated upon him a couple of years ago for an acute appendix and at the end of two years he returned with a great deal of pain and upper abdominal symptoms which, in many ways, resembled a gall bladder or kidney attack.

Gall bladder function tests revealed a perfectly normally functioning gall bladder but suggested a considerable enlargement of the right kidney. This was confirmed by intravenous urogram as shown by Dr. Allison and suggests a large hydronephrosis and a greatly destroyed kidney. However, he was subsequently examined with the cystoscope and a retrograde pyelogram was made which showed a dilated kidney pelvis with almost normal calyces and a very good function, as shown by the P. S. P. and indigo-carmen tests. On the strength of our retrograde pyelogram, we recommended an attempt at plastic surgery on the pelvis, with hopes of conserving the kidney. I believe in this instance that the retrograde pyelogram, which first emptied the kidney pelvis and injected a much more concentrated solution, gave a more accurate estimate of the actual dilitation and amount of kidney destruction.

In another instance, we examined a patient by retrograde pyelogram and catheterization and found a functionless kidney with enormous dilitation and complete destruction of the minor calyces. In fact, the pyelogram revealed the kidney to be only a large sac. P. S. P. and indigo-carmen appeared in quantities insufficient for analysis at the end of twenty to thirty minutes. This man had been examined by his family physician by intravenous urography, and because the kidney filled and could be demonstrated, he concluded that it could not be functionless and disagreed with the diagnosis and treatment. The patient was subsequently seen by Dr. Owre, who confirmed our diagnosis and recommended nephrectomy. Operation revealed the kidney to be a mere shell which was functionless.

There is no doubt of the efficiency of the intravenous method but I believe that these two patients show conclusively that we may not count upon it as a positive function test nor is it as reliable as retrograde pyelogram for the diagnosis of many kidney lesions.

Jas. K. Anderson, M.D.,
Secretary.

SOCIETIES

IMPORTANT MEETING

Minnesota State Medical—University Clinics. Monday, March 26, 1934; Tuesday, March 27, 1934. University of Minnesota Hospitals, Minneapolis. Thirty-four half hour practical demonstrations by members of the Clinical Staff of the Medical School. Monday, March 26, 1934—8 A. M. to 9:00 P. M.; Tuesday, March 27, 1934—8 A. M. to 5:30 P. M., with a morning and afternoon recess of 15 minutes and one hour for luncheon and dinner. Seventeen clinics on the diagnosis and treatment of cancer and seventeen clinics on practical subjects in medicine, neurology, dermatology, surgery, urology, orthopedics, obstetrics, gynecology, ophthalmology, otolaryngology, diagnostic X-ray and preventive medicine. The clinics in malignancy will include the bladder, prostate, bone, breast, bronchi, lung, esophagus, eye, lymph node, lib and oral cavity, ovary, pharynx, larynx, rectum, skin, stomach and uterus. In addition, special demonstrations will be made of the use of X-ray and radium. All of the clinics will be practical and patients will be shown. Registration: Details to be announced later.

MINNESOTA STATE MEDICAL ASSOCIATION

Several exhibits of especial interest are planned for the 81st Annual Meeting of the Minnesota State Medical Association, to be held at Duluth, July 16, 17, and 18, 1934. One is the prize winning pneumonitis exhibit pre-

pared by John W. Towey, superintendent of the Pinecrest Sanatorium, Powers, Michigan, awarded the medal at the Milwaukee meeting of the American Medical Association. The exhibit is of especial interest and significance to the medical profession in Minnesota inasmuch as it includes the Minnesota hardwoods that have been found to affect workers, here, also complete X-ray films. Dr. Towey has consented to present a paper on pneumonitis, according to the Committee on Scientific Assembly, now engaged in shaping the program for the three-day Duluth session. The Diabetes Committee of the State Society, under the chairmanship of Russell M. Wilder, Rochester, will sponsor another exhibit of unusual practical value at this meeting. Several sessions for small groups will be held each day in connection with this exhibit. Talks will be given these small groups, together with special instruction in the administration of insulin and in planning special diets. It is proposed that the series take the form of a post-graduate course in diabetes. Arrangements are practically complete, the Committee reports also, for a notable cancer exhibit with special demonstration of various new diagnostic methods including transillumination of the breast and the Schiller test. Another exhibit of especial current interest will show the effects of certain harmful cosmetics, particularly those used for dyeing eyelashes and eyebrows, which have received so much medical attention of late. Arthur J. Cramp, Director of the Bureau of Investigation of the American Medical Association, who prepared the exhibit, will be present himself to talk at the meeting on this subject. A heart exhibit and demonstration and an interesting symposium on endocrines are to be further features of the meeting.

NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. David M. Fleet, South Shore, S. D., was recently married to Miss Marie Leighty of Aberdeen

Dr. L. W. Clark, formerly of Chester, Iowa, has opened offices for general practice at Spring Valley, Minn.

Dr. C. J. Ohlmacher, Vermillion, S. D., was the guest speaker at a meeting of the members of the Cosmopolitan Club at Sioux Falls last month.

The Rosebud Medical Society held their monthly meeting at Winner, S. D., with Drs. S. J. Walters and F. S. Wilson being the principal speakers.

Dr. F. H. Wagoner, of the University of North Dakota Medical School, at Grand Forks, was recently married to Miss Helen Hitesman of Baton Rouge, La.

The eye, ear, nose and throat specialists of Montana, held their annual meeting at Missoula last month. Dr. L. G. Dunlay, is president, and Dr. Ashley Moore, secretary.

At the semi-annual meeting of the Montana Medical Association held at Billings, on Feb. 12, it was decided to hold the annual meeting at Helena, on July 11 and 12, 1934.

Dr. L. G. Smith, Mandan, N. D., who has been seriously ill for several months is able to again resume his active practice, which was welcomed by his many patients in that city.

Dr. R. C. Scammon will speak at the Hennepin County Medical Society's parlor on Wednesday noon, March 7, his topic being "Medical Indexes." A large attendance should be present.

Dr. N. A. Biorn, who has been in active practice at Jackson, Minn., for the past twenty years, died suddenly on February 6th, from a heart attack. Dr. Boirn was a graduate of the University of Minnesota.

The members of the Kandiyohi-Swift-Meeker County Medical Society, held their monthly meeting at Willmar, Minn. Dr. R. P. Cranmer, Minneapolis, presented a paper entitled "Fractures of the Upper Extremity."

At the annual meeting of the North Dakota State Medical Association, Fargo, June 5th and 6th, Dr. E. Starr Judd, Rochester, ex-president of the American Medical Association, will give a clinic and present a paper.

Dr. Fred N. Hunt, pioneer physician of Fairmont, Minn., passed away last month at the advanced age of 77 years. The docter's death was caused by a fall on the steps of his home, from which he never recovered.

Medical study and research at the University of Minnesota under the Mayo foundation received a gift of $500,000 from the Mayo Properties association representing the famous Mayo brothers medical center at Rochester.

Dr. G. M. Williamson, Grand Forks, N. D., secretary of the North Dakota state board of medical examiners, was guest of honor at a dinner given by the Minneapolis editorial board of THE JOURNAL-LANCET, on February 15th.

The Northwest District Medical Society held their February meeting at Minot, N. D., on February 22, with a large number of members present. They enjoyed a paper presented by Dr. P. J. Breslich, Minot, on "Renal Functions."

Dr. Arthur Steindler, Iowa City, Iowa, will be the guest speaker at a meeting of the Hennepin County Medical Society, on Monday evening, March 5, at 7:45. His subject being "Treatment of paraplegia in Tuberculosis of the Spine."

Dr. Angell S. Hoiland, Minneapolis, was called by death on February 22, at the age of 50 years. Dr. Hoiland was a graduate of the University of Minnesota Medical School in 1910 and had always been active in church and hospital work.

Dr. Aaron Stolinsky, Sheldon, N. D., was recently elected to membership in The American Medical Editors' and Authors' Association. Dr. Stolinsky is also the co-editor of *Ars Medici*, the Journal of the American Medical Association of Vienna.

Dr. Arnold Schwyzer, St. Paul, was recently honored by a complimentary dinner, sponsored by the sisters of St. Josephs Hospital. Dr. Schwyzer has been on the staff of that hospital for nearly forty years. Dr. W. J. Mayo, Rochester, was the principal speaker.

Dr. F. M. Crain, Redfield, S. D., well known and beloved physician of that section of the state, passed away last month after a short illness. Dr. Crain has always taken an active interest in the district and state medical societies, and was a past president of the state society.

Dr. W. A. Fansler, Minneapolis, was the guest speaker at the dinner meeting, January 29, of the Chippewa County Medical Society at Eau Claire, Wisconsin. He presented the following paper "Factors Influencing the Choice of Operation in Carcinoma of the Rectum and Rectosigmoid.

Dr. Walter L. Bierring, Des Moines, Iowa, president-elect of the American Medical Association, will be present at the annual meeting of the North Dakota State Association, to be held in Fargo on June 5th and 6th, where he will present a scientific paper and also address the Assembly.

Among the leading medical men who have accepted places on the program of the North Dakota State Medical Association's annual meeting, to be held in Frgo, June 5th and 6th, are: Dr. E. M. Hammes, St. Paul; Dr. E. F. Robb, Minneapolis; Dr. Julius O. Arnson, Bismarck, and Dr. A. M. Snell, Rochester.

Washington County Medical society met recently at Stillwater, Minn., with F. S. McKinney, M.D., assistant professor of surgery of the medical department of the University of Minnesota as speaker. The subject was "Modern Treatment of Herniae and Varicose Veins." The doctor's experience in this line covered something over 2,000 cases.

Officers of all county and district medical societies affiliated with the Minnesota State Medical association held their annual mid-winter conference on administrative and economic problems of the profession at St. Paul. Governor Floyd B. Olson and Dr. W. W. Bauer, Chicago, director of the bureau of health and public instruction of the American Medical Association, were the principal speakers.

Dr. O. J. Hagen, Duluth, has been named an executive committee member of the Minnesota Public Health Association. Dr. Hagen is a member of the University of Minnesota board of regents, and formerly served as president of the Northwestern Minnesota Medical Association. For seven years he served as president of the board of the Sand Beach Tuberculosis Sanatorium, Lake Park, Minn.

Dr. Dean Lewis of Baltimore, president of the American Medical Association, recently said, that the depression had reversed the trend toward specialization and restored the general practitioner to his former position. "The general practitioner has fared better in the last few years than has the specialist. Many persons have found they could be treated satisfactorily in their own homes by their family physicians."

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocyles or 370.2 meters). William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota, is the speaker. The program for the month of March will be as follows: March 7th, "Heart Adaptations"; March 14th, "Scarlet Fever"; March 21st, "Anemia and Its Treatment"; March 28th, "Cancer of the Cervix."

The JOURNAL LANCET

Minneapolis, Minnesota
March 15, 1934

New Series
Vol. LIV, No. 6

Hospital Standardization From the Community Standpoint*

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Chicago, Ill.

GENERAL and community hospitals and the practitioners of scientific medicine are so closely allied in a partnership, in the present day practice of medicine, that neither could exist without the other. Therefore, the people are best served from the standpoints of health and human welfare if there is available in each community a hospital organization of such type as will give to the practitioner of medicine and his co-workers the most desirable environment, for it is in such an environment that the patient receives the highest degree of scientific medical and surgical service.

In 1873, only sixty years ago, we had in America 149 hospitals, which contained approximately 35,450 beds. In 1933, there were 7,089 hospitals, with 1,014,354 beds. These figures indicate the increasing use of hospitals in all branches of the practice of medicine. Today, we are told that eight million people enter the hospitals of the United States each year, an average of one patient every four seconds. And this does not include the 18 or 20 million visits which are made during each year to the out-patient departments of hospitals.

The American College of Surgeons, established in 1913, included among its original purposes the betterment of medical education and of the clinical practice of medicine. The intelligent distribution of the benefits of medicine to mankind is inseparable from these purposes.

Successful work is most easily accomplished in a proper environment. As case records were submitted by applicants for Fellowship in the College, there was early evidence that much surgical work was being done in hospitals that lacked many facilities essential in the scientific care of the patient. Cases were unsystematically recorded; laboratory facilities were woefully deficient; medical staffs were unorganized; and the professional work was generally without supervision.

When applicants were refused admission to the College because of unacceptable case records, hospitals interested themselves in the requirements of the College, and asked for an outline of acceptable record forms and suggested standards for laboratories and for staff organization. Thus a grave responsibility was thrust upon the American College of Surgeons.

For two years a preliminary analysis of hospitals was quietly pursued, and the program of the College was built upon the cumulative wisdom of those concerned with it. During the hectic years of the World War, as the College helped the Government to create a standard hospital system, its own program developed. The Board of Regents decided that while the College must always assume the attitude of an adviser, the time

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*This paper especially prepared for the HOSPITAL NUMBER of THE JOURNAL-LANCET.

had come for them to shoulder the responsibility of furnishing a Minimum Standard for hospitals, which would safeguard the care of every patient within a hospital by insistence upon competence on the part of the doctors, and upon adequate clinical and pathological laboratory facilities to insure correct diagnoses; by a thorough study and diagnosis in writing for each case; by a monthly audit of the medical and surgical work conducted in the hospital during the preceding interval; and by prohibiting the practice of the division of fees under any guise whatsoever. A formal Minimum Standard for Hospitals was formulated and adopted, after consultation with the most eminent medical and hospital authorities. It reads as follows:

Minimum Standard for Hospitals

1. That physicians and surgeons privileged to practice in the hospital be organized as a definite group or staff. Such organization has nothing to do with the question as to whether the hospital is "open" or "closed," nor need it affect the various existing types of staff organization. The word STAFF is here defined as the group of doctors who practice in the hospital inclusive of all groups such as the "regular staff," the "visiting staff," and the "associate staff."
2. That membership upon the staff be restricted to physicians and surgeons who are (a) full graduates of medicine with the degree of Doctor of Medicine, in good standing and legally licensed to practice in their respective states or provinces; (b) competent in their respective fields; and (c) worthy in character and in matters of professional ethics; that in this latter connection the practice of the division of fees, under any guise whatever, be prohibited.
3. That the staff initiate and, with the approval of the governing board of the hospital, adopt rules, regulations, and policies governing the professional work of the hospital; that these rules, regulations, and policies specifically provide:
   (a) That staff meetings be held at least once each month. (In large hospitals the departments may choose to meet separately.)
   (b) That the staff review and analyze at regular intervals their clinical experience in the various departments of the hospital, such as medicine, surgery, obstetrics, and the other specialties; the clinical records of patients, free and pay, to be the basis for such review and analysis.
4. That accurate and complete records be written for all patients and filed in an accessible manner in the hospital—a complete case record being one which includes identification data; complaint; personal and family history; history of present illness; physical examination; special examinations, such as consultations, clinical laboratory, X-ray and other examinations; provisional or working diagnosis; medical or surgical treatment; gross and microscopical pathological findings; progress notes; final diagnosis; condition on discharge; follow-up and, in case of death, autopsy findings.
5. That diagnostic and therapeutic facilities under competent medical supervision be available for the study, diagnosis, and treatment of patients, these to include, at least (a) a clinical laboratory providing chemical, bacteriological, serological and pathological services; (b) an X-ray department providing radiographic and fluoroscopic services.

This finished document has achieved international fame. The principles of the Minimum Standard are the same today as they were when the standard was established in 1918, but interpretation has broadened to meet the changing conditions of society. Hospitals must develop and progress so that they may keep pace with the growing demands of their respective communities.

Acceptance of the Minimum Standard is entirely voluntary, as is the maintenance of its requirements. The Minimum Standard is concerned with the fundamental principles and essentials of good hospital service, and with the safe and efficient care of every patient, but in no way does it deprive an institution of its individuality. It is readily adaptable to local and varying conditions. A hospital, by maintaining the Minimum Standard, qualifies itself for individual growth and development.

Growth of Hospital Standardization

Each year has seen an increase in the number of hospitals surveyed by the American College of Surgeons, until the present scope of hospital standardization has far exceeded the anticipation even of its most zealous founders. No better indication of progress could be presented than the figures for 1933. Of 3,555 hospitals surveyed, 2,376 are approved. In 1918, only 89 hospitals were worthy of receiv-

ing approval. Notwithstanding the fact that the number of hospitals surveyed has multiplied more than five times, the extent of approval has increased from 12.9 per cent in 1918, to 66.8 per cent in 1933.

To date, more than 31,000 individual surveys of hospitals have been made by the American College of Surgeons, the largest single accumulation of actual findings dealing with hospital problems. This vast amount of material is of invaluable aid to hospital executives, as is also the information offered by the Hospital Research and Information Department of the College. It is the aim of the hospital department of the College to give aid and assistance that will advance the cause of scientific medicine and efficient hospital care.

Hospital Standardization in the Community

What does hospital standardization mean to a community? It should mean the fulfillment of the four broad functions undertaken by every community hospital desiring the approval of the American College of Surgeons: 1. The safe and adequate care of the sick and injured; 2. the education of doctors, nurses, internes, and hospital personnel; 3. the prevention of disease; and, 4. the promotion of scientific research.

Hospital standardization has brought great benefits to every community whose hospitals have joined in the movement, not only because the institutions themselves have improved, but because these improvements have made possible safer and more adequate care of the community's sick and injured.

One out of every ten persons in each community requires hospital care every year. Hence it is important that the service provided shall be as scientific and humanitarian as possible. The College, through the Minimum Standard, has aided hospitals to become both scientific and humanitarian.

In the final analysis, one of the most important, if not *the* most important, duty of every community is the protection of the health of its citizens. In every hospital which is approved by the American College of Surgeons, all facilities, all personnel, and all services are focused on the welfare of the patient. The patient is assured of safer and more adequate service in an approved hospital because such an institution has proper facilities for diagnosis and treatment, competent and adequately trained personnel, and a carefully selected and thoroughly organized medical staff.

Irregular practitioners of medicine cannot attend patients in an approved hospital. The College stands firmly for one type of doctor only—the qualified graduate of an acceptable school of medicine, with an M.D. degree. There can be no compromise. The College vigorously combats such unethical practices as the splitting of fees under any guise whatsoever, insisting that patients should be protected so that the fees charged them are not divided among two or more practitioners. The College believes that fee-splitting encourages unnecessary and frequently incompetent surgery, and in every way commercializes the practice of medicine.

As the laboratory facilities in approved hospitals must be under competent direction, means are provided for accurate study of every case. Thus the patient is protected against snap diagnosis and treatment. The clinical records and the staff conferences furnish the basis for analysis, and determine the true worth of the clinical work of the hospital.

Regular staff conferences contribute to the education of the physician and the surgeon. In the approved hospital every physician is afforded an opportunity to study and analyze his own actual results, as well as those of others, carefully correlated with laboratory, X-ray, and other findings. He can be assured that the standardized hospital maintains competent supervision over the various facilities of the hospital, and that his patients will receive the treatment which is ordered. In the approved hospital, where accuracy and thoroughness are the standard by-words, the practitioner of medicine is constantly improving his store of medical knowledge through demonstrations, staff conferences, consultations with proficient colleagues, and other daily contacts. Therefore, the approved hospital provides valuable opportunities to its staff members for post-graduate education, thus broadening their knowledge, which, in turn, means better service to the sick of the community. It has been found that the more able physicians and surgeons prefer to make the approved hospital their workshop. It is certainly an advantage to the community, then, to have the hospitals comply with the requirements of the Minimum Standard.

In addition to the educational facilities which an approved institution provides to the practitioner of medicine, excellent training is afforded to the interne and to the student nurse. Those communities which possess ap-

proved hospitals may be sure that the young men and women who are being trained therein are receiving competent instruction and adequate experience, for they are working under the most satisfactory environment in which science and humanitarianism have joined hands to thwart disease and to save human lives. Others seeking to prepare themselves for professional careers, such as dietitians, pathologists, and bacteriologists, also derive excellent training and experience in approved institutions. Here again does the patient benefit, inasmuch as standardized hospitals accept for training only those individuals who have the highest mental, physical, and moral qualifications.

The standardized hospital endeavors to promote better public and personal health and welfare conditions throughout the community. The establishment of the Health Education Forum in approved hospitals affords the community an opportunity to learn about healthful living and the prevention of disease.

Health Inventorium

The Health Inventorium is an added function for the community hospitals. Every approved hospital has all of the requirements in laboratories, scientific apparatus, and trained technicians and medical aids that are the boast of the most approved diagnostic clinic. Hence the College has suggested to the approved hospitals that they extend their diagnostic facilities to independent, qualified practitioners of scientific medicine through a department to be known as a "Health Inventorium."

Prevention has become an outstanding factor in medical practice. The public is more and more interested in the practical application of preventive measures in dealing with personal health. Twenty-five years ago but a scattering few appreciated the advantages of a periodic health examination, whereas millions are now demanding this service; and the increase in these health audits ranges in some communities from 100 to 1,000 per cent.

The majority of the people prefer to go to their own family doctor for these examinations. This desire is so universal, and the beneficial results of the examinations are so obvious, that the general practitioner is now called upon to apply preventive as well as curative measures in his every day practice. What greater and more appropriate service could the approved community hospital render to the people and to the profession than to establish a model Health Inventorium?

Cancer Clinics

The public is mindful of the great menace of cancer, and of the fact that this disease, with its annual toll of one hundred and fifty thousand individuals, can be prevented in many cases if it is discovered early and if proper treatment is applied. The purpose of cancer clinics in approved hospitals is to enable the physician to take his patient to these clinics, receive the benefits of contemporaneous knowledge of cancer, of every modern facility for scientific examination, and of the most approved methods of treatment. What could be more appropriate than to have every approved community hospital establish a cancer clinic?

Minimum Standard for Cancer Clinics in General Hospitals

1. *Organization.* There shall be a definite organization of the service, and it shall include an executive officer and representatives of all the departments of the hospital which are concerned in the diagnosis and treatment of cancer. The services of a secretary and of a social service worker shall be available.
2. *Conferences.* As an essential feature of the service there shall be regular conferences or consultations at which the diagnosis and treatment of the individual cases are discussed by all members of the clinic who are concerned with the case.
3. *Patients.* Reference to the cancer clinic of all patients in whom the diagnosis or treatment of cancer is to be considered shall be either voluntary or obligatory in accordance with the vote of the medical staff or of the governing board of the hospital.
4. *Equipment.* In addition to the diagnostic and therapeutic surgical equipment which is required in every approved general hospital there shall be available an apparatus for X-ray therapy of an effectiveness which is generally agreed upon as adequate, and an amount of radium sufficient to insure effective treatment.
5. *Records.* In addition to the records which are required in every approved general hospital, there shall be additional records of: (a) The details of the history and of the examination for cancer in different regions of the body, such as are indicated on the form records which are recommended by the Committee on the Treatment of Malignant Diseases, American College of Surgeons; (b) The details of the treatment by radium or

X-ray as indicated on the form records which are recommended by the Committee on the Treatment of Malignant Diseases, American College of Surgeons; (c) Periodic examinations at intervals for a period of at least five years following treatment.

6. *Treatment.* The treatment of cancer patients shall be entrusted to the members of the staff of the cancer clinic except in cases in which adequate treatment in accordance with the collective recommendation of the staff of the cancer clinic can be procured otherwise.

Industrial Medicine and Traumatic Surgery

The industries, great and small, men and women serving in industry, and physicians who are called upon to care for the thousands of traumatic cases outside of industry, are seeking opportunities for better service. Some of the larger industries already provide such facilities to their people. Preventive health measures, and the proper care of ill and injured employees, makes of them more efficient and effective workers and residents of a community.

Who can better aid in giving service to the smaller industries than the community hospitals? Thousands of traumatic injuries occur outside of industry. Who can better provide appropriate and economical service to these cases than the approved community hospitals?

Minimum Standard for Industrial Medicine and Tramatic Surgery

1. That the industry shall have an organized medical department, or service, with competent medical staff including consultants and adequate emergency dispensary and hospital facilities and personnel to assure efficient care of the ill and injured.
2. That membership on the medical staff shall be restricted to physicians and surgeons who are (a) graduates of scientific medicine holding the degree of Doctor of Medicine, in good standing and licensed to practice in their respective states or provinces; (b) competent in the field of industrial medicine and traumatic surgery; (c) worthy in character and in matters of professional ethics, that in the latter connection, the practice of the division of fees under any guise whatsoever be prohibited.
3. That there shall be a system of accurate and complete records filed in an accessible manner—a complete record being one which includes identification data; cause of illness or injury; nature and extent of illness or injury; detailed description of physical findings; special examinations such as consultations, clinical laboratory and X-ray; tentative or provisional diagnosis; treatment; prognosis with estimated period of disability; progress of illness or injury; final diagnosis; condition on discharge; end results; and such additional information as may be required by statute for Workmen's Compensation claims or for other purposes.
4. That all patients requiring hospitalization shall be sent to institutions approved by the American College of Surgeons.
5. That the medical department shall have general supervision over the sanitation of the plant and the health of all employees.

Summary

Scientific research is promoted in the standardized hospital through the keeping of accurate clinical records, and the holding of regular staff conferences. The case records make possible the correlation of clinical evidence and throw light upon the diagnosis and treatment of disease; and the correlation of clinical records with the findings from autopsies is of invaluable aid in furthering knowledge of certain diseases.

The spirit of true research is encouraged in every physician practicing in a standardized hospital. End results are studied at staff conferences, as a guide to further clinical work. The standards of the medical profession are raised by the emphasis which an accredited institution places upon scientific research.

The first and foremost purpose of the approved hospital is to provide safe and adequate care for its patients. The inestimable value of having its sick and injured properly cared for would be sufficient reason for a community to promote the cause of hospital standardization. But, in addition to the rehabilitation of patients, the standardized hospital aids in the prevention of disease. It promotes scientific research. It provides adequate training for nurses, internes, and others who are seeking to prepare themselves for professional carreers, and gives to the practicing physician a valuable post-graduate training.

Among the more important benefits that have accrued to the public as the result of hospital standardization are the following:

1. Every safeguard surrounds the hospital patient.

2. The average days' stay of patients in hospitals has been greatly reduced.

3. Hospital mortality rates have been definitely lowered. With all of these resulting

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The Charity Hospital and Its Relations to the Practicing Physician*

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MEDICINE is a profession—not a business, and being a profession it is practiced, in this country at least, in a dual form. Its clients, when financially able, have been justly expected to pay for the services they receive; when impoverished, either through misadventure or through incompetence, medical services have been rendered to them without cost.

This is, I think, a fair statement of the general economic code under which the physician in private practice has operated. It is freely admitted that not every member of the profession has or could follow this code to the letter. There are exceptions to all rules and all definitions.

Along with the free or charity work done by the practicing or private physician falls the similar work done by charity hospitals. Free or charity hospital work is not, of course, confined to *public* hospitals, for there are few hospitals of any type that will turn away the seriously sick destitute from their doors. As we all know, a considerable, if not the greater part, of the free or charity work in hospitals is done by physicians who also engage in some form of private practice.

Thus the problem of free or charity medical attention for the poor is a joint one faced both by the hospital, and by the physician, and the solutions of problems arising from this type of care should be met jointly. These problems have become increasingly difficult during the last four years due to economic stress.

Statistics are sometimes unpleasant, but I think they are worth consideration at the present time. In 1929 the gross income of this country was estimated at nearly 90 billion dollars, yet even in this year of prosperity the most frequent family income was about $1,800, and one-half of all families had an annual income of $2,000 or less. The estimates of total national income for 1932 vary from 35 to 50 billion dollars and at one time in the year the number of families receiving public aid rose to a peak of over 4.5 millions.

At the same time both private and public expenditures for health fell from a sum approaching four billion dollars to approximately two billion dollars.[1] This decline in expenditures was approximated in all major budget items, and health cost ranked as it has for nearly thirty years at about the seventh item in expenditures of the American public, although the actual amount of money spent for health services had been greatly reduced.

This change has thrown an almost overwhelming load both on the physician furnishing charity services and the hospitals acting as charitable institutions. Both the physician and the hospital have seen a diminution in income and have faced heavier burdens. There has never been a time when the relations betwen the two might more easily be strained or a time when co-operation between the two was more necessary to both.

It goes without saying that every hospital dealing with charity cases will in this time of stress practice all measures of economy consistent with good medical care. This calls for the most careful budgeting and inspection of costs, and a large measure of devotion on the part of hospital personnel, and of nursing and medical staffs. It calls for painstaking estimates of future costs and expenditure as well. These measures are necessary to keep within budgetary figures and to care for as many as possible of the truly indigent.

In the institution with which I am associated the hospital is primarily a teaching adjunct and approximately 90 per cent of the beds are occupied by charity patients. Of these charity patients by far the greater number are supported by state and county funds although funds provided by private beneficence allow the treatment of patients of certain types, particularly those afflicted with cancer and a number of orthopedic cases.

The selection of our charity or free patients seems to me to be one of the most important factors in our hospital policy, for an unwise selection in this category would admit persons able to pay for hospital care. This would be to the prejudice of the practicing physician, the private hospital and above all to the truly indigent sick, for with a waiting list and a set budget for free hospital care the admission to a

1. R. R. Doan: The Measurement of American Wealth, New York, 1933.

*This paper especially prepared for the HOSPITAL NUMBER of THE JOURNAL-LANCET.

free bed of one patient who can provide for his own hospitalization means the penalization of a genuinely poor and ill person who is waiting for attention. It requires also the selection among the indigent sick applying at our doors of cases that are suitable for teaching purposes, although I do not feel that in humanity the latter type of selection should be carried to the point of turning away the indigent who are truly emergency cases. A great deal of time has been given to working out a classification of "emergency" that will be at once just and human.

In attempting to evaluate the financial status of applicants for free medical care the following criteria have been formulated:

(1) Income (including barter).

(2) Property.

(3) Debts (we always make a point of including medical debts in this item).

(4) Number and status of dependents.

(5) Responsibility of other relations for care of applicant.

(6) Nature of illness.

A few comments on some of these items may be of interest. Under (1) income, we have adjusted this scale downward with the general drop in income although, in fact, we are finding that income has been dropping among our applicants and particularly that it has been becoming more uncertain with the increase of unemployment. Barter has become a distinct factor in the income of our patients and should not be omitted.

Under (2) property, it must be remembered that property values have decreased considerably in the last few years; and that some property has been quite unsaleable except at a confiscatory figure, and therefore some latitude must be allowed in estimates of property value.

The checking of (3) debts, is a considerable task but seems necessary to a proper estimate of the financial status of the patient.

The number of dependents, (4), and responsibility of other relations, (5), also is a matter of importance for the financial stress of the last few years has greatly changed the family groups and has loaded family responsibility on persons formerly free of them.

The type of disease, (6), plays a part in the selection, for often a person is able to and should pay a private physician for attention to a minor defect or illness, whereas the meeting of a serious or long drawn out sickness is beyond their financial resources.

It will be remembered that all our in-patient, free or charity, cases are sent to us with physician's letter and also an authorization drawn by county authorities so that our procedures are a secondary process following a preliminary investigation at their place of residence. Our out-patients must also present evidence of eligibility from their physician or, if they have no personal physician, undergo a close scrutiny of their financial status.

I cannot claim that our system is 100 per cent perfect—no system that deals with human beings is. I believe, however, that the percentage of misjudgments is relatively small and that the system represents a sincere and whole-hearted effort to co-operate with the private physician in this time of economic stress.

HOSPITAL STANDARDIZATION FROM THE COMMUNITY STANDPOINT

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benefits, no community should be satisfied until its hospitals have attained the Minimum Standard.

Hospital standardization is a progressive movement; it is scientific and humanitarian; it gives to the community a veritable fortress for the prevention and cure of disease. Indeed, it safeguards the very life of the community.

The Social Equation: "In Relation to Hospital Problems"*

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TODAY the hospital world, of America at least, faces the most crucial problems that have ever confronted it, and these problems demand consideration not singly, but en masse. It is like an army attacked not only on one sector but besieged, as it were, by overwhelming numbers on all sides at once. Like a country whose very existence depends upon the outcome of a war, they have no time for the pacifist and must give him but short shrift if they are to survive. Only by an aggressive front may the hospitals retain their footing. Not only are forceful generals needed—the outcome depends equally or more upon the keen, collected thought devoted to the situation, and calls for the ablest efforts of the best trained minds of the hospital field.

Some of the problems with which our hospitals are confronted undoubtedly take their origin in those hospital backgrounds which I have discussed in another paper.* But these now exercise only a passive influence, and regardless of what bearing they may have had upon the development of the present situation, they nevertheless do not now strike at us aggressively or demand any great quota of our thought and energy. More virile issues rise up to do battle with us and will tax our ingenuity and initiative as well as our combined courage and combativeness if we are to come off victors in the battle.

For at least ten years past, to the writer's personal knowledge, and for how many years before that he does not know, articles have appeared from time to time in periodicals of hospital character as well as in the lay press, mentioning the dangers of too paternalistic an attitude in hospital activities and sounding a warning. Yet we are today undoubtedly suffering from the results of this very fault. We have created a juggernaut which threatens to crush us under its weight, a Frankenstein which has gotten out of hand and threatens to destroy its creator. Part of this is our own fault and has arrived as we were warned that it would arrive. The fault does not lie entirely within ourselves; there have been other contributing factors. However, solving an embarrassing situation does not consist in first exculpating ourselves. Hence, we may well consider for a moment those mechanisms by which we ourselves fashioned our persecutor.

The Building of Hospitals

In the first place we built hospitals. That was nothing new, for history tells us that in India there were wonderfully developed hospitals as early as 250 A. D., which gave medical and nursing care, not alone to those of the community who could pay for the service, but likewise to the indigent wayfarer who came to its doors. Nevertheless, to our people the hospital came as an unknown quantity and they first looked askance at it. Even in the brief period of the writer's own lifetime he can recall when many people of the community, the well-to-do financially, as well as the indigent, only consented to enter a hospital as a last resource, under protest, and with the lingering thought that "Ye should give up all hope who enter here."

Educational Propaganda

We next proceeded to educate the public. The physician was the first to appreciate and grasp the advantages of the hospital. By the assembly of his patients under one roof in a hospital he was enabled to call upon twenty of his patients in the same period of time that it ordinarily took him to call upon one and render service in the home. He charged the same fee per visit and, therefore, it afforded him the opportunity of multiplying his income by twenty at the same time that his facilities for rendering professional service were improved. Or we can put it the other way, that with an expenditure of one twentieth of the effort he achieved the same financial return. The doctor, therefore, at once became one of the hospital's best press agents, a voluntary salesman for those wares which it had to sell, namely, service.

Philanthropic and Social Service Influences

Then the philanthropist stepped into the picture and bespoke for the indigent a greater

*This is the second of a series of six papers on the subject "Hospital Problems." The subtitles of the several papers are: (1) "Hospital Backgrounds"; (2) "The Social Equation"; (3) "National, State, County and Municipal Hospitals"; (4) "Nursing Backgrounds"; (5) "Medical Backgrounds"; (6) "The Road from Yesterday to Tomorrow."

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*This paper especially prepared for the HOSPITAL NUMBER of THE JOURNAL-LANCET.

opportunity to enjoy and receive these same benefits made available for the well-to-do. We welcomed him with open arms, and our watch words became "benevolence," "charity," "love," "kindness," and last but not least, "alms." Philanthropists vied with one another. We built larger hospitals. Social service workers, a new profession, saw the light of day. They were ostensibly created as an intermediary between the physician and the patient, that the former might have a more intimate understanding of the life problems of the latter and contribute more ably to the patient's health as a result of this better understanding; they were the messengers of benevolence and charity to the indigent, and the arm of the philanthropist thus reached out to help the needy in their own homes. But it should not be lost sight of that the philanthropist was another salesman for the hospital, and that the social worker became a very highly specialized salesman for this same service.

The Visiting Nurse Program

Visiting nurse organizations sprung into being in every metropolitan area. These again were ostensibly created to carry medical thought and service into the home, but likewise became active salesmen for that type of service which centered in the hospital. A vast whirlpool was created whose eddies, the physician, the social worker, and the visiting nurse, flung outward in an ever widening circle, drew into its vortex, the hospital, more and more of an increasingly amenable public.

Dispensaries and Out-patient Service

One further factor remains to be mentioned as entering influentially into this program of widening the scope and activity of the hospital. I refer to the hospital "out-patient department," dispensary or clinic, as the activity has been variously designated. It is a well known fact that the "dispensary," so-called, derived its name from the fact that originally its primary function was that of "dispensing" drugs and remedies of various kinds to the needy of that particular community which it was created to serve. Frequently established as the adjuvant of a medical school, it soon came, however, to be an ally of the hospital, and in most instances in later years has become a department of a hospital even if and where originally established as an independent and separate activity. Conceived as a medium, like the social service and the visiting nurse associations, which would bring the light of medical knowledge to those who did not need to be admitted to a hospital and put to bed under the constant, twenty-four hour supervision of a physician, it has nevertheless, been one of the greatest sources of hospital admissions. And this does not necessarily negative the thought that it is looked upon as the most adequate facility for preventing the cluttering up of hospital beds with unnecessary, and particularly, with uninteresting occupants.

It may be well to remark here that in a paper such as this, interested as we are with principle rather than statistics, we are not concerned in the age old question of "which came first, the chicken or the egg!" Those who may be interested in the question as to whether social service activities or visiting nursing activities came first into being can settle those qualms which beset them by going to any good library and referring to volumes relating to the history of the development of these two great fields of endeavor. The same holds true as regards the question of the time equation in the development of dispensaries and hospitals. The writer has merely attempted to set forth the fact that there is an inter-relation between these several activities and that they have all contributed, and are inseparably related to the hospital problems of the present day.

The several agencies and factors which have been referred to in the preceding paragraphs of this article have contributed the thinking head to that Frankenstein which confronts the hospital world today. Through their multifarious activities the public, and particularly the indigent public, has been completely sold on the idea of hospitalization for illness. They have been so thoroughly sold that they today demand hospitalization and medical and nursing care for ailments so minor in character, that the average solvent business man, to say nothing of the more than a million persons engaged in activities related to the hospital, would not even think to mention them even to the members of his or her immediate family, but would go ahead with the day's work and forget all about being ill.

The hospitals caring for the indigent, and the out-patient departments of those hospitals throughout the country are clogged with, and beset daily by thousands upon thousands of these individuals, who, if they were paying for the medical care they demand, would be working and earning the daily bread for their families, and who would be physically no whit the worse off for it on the morrow. Nor does this statement in any wise intend to controvert those ideals of prophylaxis and preventative medicine, in

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Prospectus of Minnesota Hospital Statistical Bureau*

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A WIDE-SPREAD need exists in the State of Minnesota for better administrative hospital statistics. In part this need comes from the changing currents of economic hardship which have been swirling at the base of the hospital structure, both private and public, for the last four years. Many private institutions have been forced to operate at a 40 to 60 per cent bed capacity, while charity institutions have been buried under the deluge of indigent sick. The hospital and medical care of workers on various government projects have added new problems. Relief funds for medical care have become available to the medical profession in limited degree. Group hospitalization and hospital insurance plans present rather complex statistical problems. The state, loaded with relief work and dispensation of relief funds, frequently finds itself wrestling with inadequate knowledge for meeting the situation. Public charities dispensed from many organizations are in need of better clearance than is offered by their confidential exchanges.

In view of these needs and the complexity of the problem, it is extremely timely that the Executive Committee of the Minnesota Hospital Association has decided to experiment in order to determine the advisability of establishing under its auspices a *Minnesota Hospital Statistical Bureau*. On December 28, 1933, the Executive Committee of the Minnesota Hospital Association approved a proposal made by Dr. Halbert L. Dunn, Director of the University Hospital "—to undertake an experiment in setting up a central statistical service for those hospitals in Minnesota which wish to co-operate in obtaining better tabulation of their hospital morbidity statistics, their cost statistics, better cross-index of the clinical records within their institutions and in the production of inter-hospital statistics." At its meeting on January 25, the Twin City Hospital Executive Council expressed their interest and asked for a prospectus of the plan.

Relationship of Minnesota Hospital Statistical Bureau to Institutions of the State

All hospitals would be hesitant about joining such a Statistical Bureau if they could not be sure that any records they might submit to the Bureau for tabulation purposes would be held inviolate and remain the property of the hospital. Consequently the Executive Committee of the Minnesota Hospital Association agreed that they "—will also retain authoritative oversight of the handling of any information gathered on patients and submitted to such a central service experiment in order to protect the hospitals legally from any misuse of such data leaving their files."

The Minnesota Hospital Statistical Bureau can be considered as a centralized extension of the statistical-record departments of each of the contributing institutions. As time goes on it is anticipated that the chief record librarian of each hospital could be trained in the Minnesota Hospital Statistical Bureau for several months in knowledge of punched card and technical tabulating machinery, as well as in methods of tabulation and simple computing. This would make it possible for all the hospitals of the state to enjoy the tremendous advantages of modern up-to-date methods of tabulating, record keeping, cross-indexing, and cost accounting at a very minor cost per institution.

Advantages of a Centralized Location for the Bureau

The advantages of a central tabulating Bureau are as follows:

(a) It would act as a clearing house for any problem which demanded in its solution the comparison of facts between various institutions.

(b) It would become a most powerful cohesive instrument for the Minnesota Hospital Association, furnishing it abundantly with facts for the benefit of its members.

(c) Because of its close link with all superintendents and record librarians it would be a useful medium to affect standardization in record and administrative problems.

*Director, University Hospitals, Minneapolis.

*It is particularly opportune that I extend thanks to the many people who have aided and have been interested in the establishment of this Bureau. In particular I thank Dr. S. R. Lee of Ancker Hospital for his interest expressed over a period of two years and the time which he spent in assisting in the formation of the Registration-Discharge Sheet, Dr. Joseph Berkson at Mayo Clinic for his criticism, Mr. J. G. Norby for his interest and help, and Mr. L. G. Townsend and Miss Doris Duxbury for their generous donations of time.

*This paper especially prepared for the HOSPITAL NUMBER of The Journal-Lancet.

(d) It would spread the cost of what would otherwise be expensive tabulating machine equipment and make available the use of modern machinery at a price which none but the very largest hospitals in the country could afford, if the equipment were used by a single institution.

(e) It would centralize the use of specialized clerical help, which could be obtained by individual hospitals only at considerable effort. It would also permit the employment of the services of a trained statistician who could be of great help to doctors and administrators in their research and technical statistical problems.

(f) It offers a quick method of acquainting the various hospital executives and physicians with facts on a situation involving their common interests.

Types of Service and Whom They Will Benefit

The *types of service* which would be available to physicians and hospitals are as follows:

A. *Financial.* Financial services involve an inter-hospital comparison of income experience and methods in charges and collections, as well as an inter-hospital comparison of expense along lines of purchasing and cost accounting.

B. *Statistical Reports from Patient Records.* Efforts of this nature would involve the collection and standardization of data to be tabulated, together with the cross-indexing, tabulation and analysis of the accumulated data.

C. *Research.*

D. *Planning.*

E. *Training and Educational.*

The persons or institutions which would be benefited by the establishment of the Minnesota Hospital Statistical Bureau are as follows:

A. Hospital. Both the administrative and the medical staff.

B. The Minnesota Hospital Association.

C. Medical Profession generally. The medical societies, the practitioner, and the medical investigator.

D. The Public. Public health departments of the state and the United States. Control of care of indigent sick by state and the United States. Contact with general social agencies, such as foundations, insurance companies, etc., and cooperation with social relief agencies.

Actual Services to Be Started for Each Contributing Institution

Monthly Clearance of Purchasing Information

A survey of the divergence between the purchasing prices of comparable goods will undoubtedly result in the conservation of large amounts of purchasing power to the contributing hospitals. This service can be rendered monthly. Hospitals desiring to be in this service will mail carbon copies of their purchase vouchers to the Minnesota Hospital Statistical Bureau at the end of each month, and, within a week, they will receive back their purchase vouchers, together with the purchase list of the experience of all other institutions which have agreed to clear their purchase information.

In Fig. 1, a hypothetical example demonstrates how such a purchase list will actually appear. On it, under a given item, will appear all purchases made by any institutions. The date of the purchase, jobber and address, item unit, amount and unit price are all noted. The institution is numbered; the number appearing on the purchase list rather than the institution's name. Such a list makes evident immediately the relative goodness or poorness of purchase. For instance, in hot water bags, two quart size, Smith & Co., New York, charged institution 213 at a unit price of $1.42 while Smith & Co., St. Louis, was charging institution 145 on the same date a price of $2.25. To be sure the volume of purchase was 96 as against 6, but this should not account for such a large discrepancy. Such comparable purchase prices should serve as a powerful protection to the hospitals and result in considerable savings.

Monthly Clearance of All Facts Concerning Discharged Patients

All work of the record-librarian involving routine tabulations, medical and surgical cross-indexing, the building of admission, geographical and number files could be accomplished by the Minnesota Hospital Statistical Bureau. This would allow the record librarian to focus more attention upon obtaining complete and accurate information.

It is desirable but not absolutely necessary that as many hospitals as possible adapt their general admission-discharge sheet to a standard form. It is particularly helpful if the sheet is so arranged that a carbon copy can go to the Minnesota Hospital Association for tabulating purposes while the original copy remains a part of the permanent record. A sheet suitable for the hospital doing general work now used at several hospitals, together with rules of operation, is illustrated in Appendix 3. The various tuberculosis sanatoriums of the state are now in the process of

drafting a sheet which they can use in common for the same purpose.

Any special data to be gathered on certain patients or in certain institutions can be noted on the back of the carbon copy which is sent to the Minnesota Hospital Statistical Bureau, and if so noted will be tabulated.

It might be desirable to go to some routine form of report to be filled in by each hospital and sent to the Minnesota Hospital Statistical Bureau rather than to use a carbon of the admission-discharge sheet. This would take extra clerical work and should be avoided if the routine admission-discharge sheet can be made to serve the purpose without further clerical work.

The hospital will receive monthly a printed list ordered by case number of the data which has been coded and punched on the patients discharged during the month. An example of how such a table would look is shown in Fig. 2, A and B. The example is a hypothetical one, and is involved with only a few patients supposed to represent January and February discharges. The list could be ordered in any other way desired but this arrangement would probably suffice for a monthly list. The data of each new month would probably be sorted into that of the preceding so as to make the year's work cumulative.

In Fig. 2A the first patient is M. S. MacLean, who is revisiting the hospital for the eleventh time. He was diagnosed to have disease 1278–3–– 1345–6–– and YX89–2––, which upon decoding proves to be neurasthenia, arthritis right knee and cholecystitis respectively. These diagnoses could be decoded either in the Minnesota Hospital Statistical Bureau or in the record room of the hospitals as they are needed. The address of Mr. MacLean is 495 Hamlin avenue south. He was admitted to the Out-Patient Department in January and discharged unimproved in January, 1934. His age is 45.

If we turn to Fig. 2B we can see that his laboratory work was all negative except for a positive BMR and x-ray. He was seen by physicians number 56, 51, 55 and 58, in departments number 71, 81, and 55. He has two dependents and no children. He came to the Out-Patient Department only four times. His occupation is 920, which decoded, means farm owner. He was charged $7.00 by the hospital.

The same information which is printed in the above form can be *rearranged* and printed in *any other form* that might be desirable at a very slight additional expense.

For instance, once a year it is anticipated that permanent diagnostic cross indices will be built for all major numbers. Fig. 4, A and B represent thirteen of the patients in the foregoing list who had major diagnoses YX89 (Diseases of the liver, gall bladder, and bile duct). These disease diagnoses are assembled and printed. Suppose the hospital physician wishes to know the cases of cholecystitis (YX892–––) which were complicated by appendicitis (YX782–––), he would find but one case, No. 75691, Mr. A. Mackay, who had both conditions. If he wished to know what physicians or surgeons saw him, he could glance at Fig. 4B and see that it was physicians No. 19, 25, and 38.

Fig. 3 is a sample table to illustrate the manner in which a confidential file could be kept in the Minnesota Hospital Statistical Bureau in order to clear the overlapping institutional admittances of patients who visit several institutions. Such a file would become of particularly great value if it could be used to extend the functions of the various confidential exchanges and make them state-wide in character. In particular, such a file is needed if state-wide hospital morbidity statistics are to be of value. Patients with chronic illnesses are frequently hospitalized in a number of hospitals during the same year. Such a patient diagnosed for the same condition in several institutions should be counted as only one case if the morbidity statistics are to give an accurate picture of the number of such illnesses which are hospitalized. A complete state-wide picture of hospital morbidity statistics would offer considerable information with reference to the frequency of such morbidity conditions in the community.

Beyond these basic tabulations the services of the Minnesota Hospital Statistical Bureau would probably become special for each institution, depending on their individual needs and willingness to pay excess charges for such services. It is to be hoped that in time a considerable volume of research and special tabulation could extend the service and its usefulness to the medical investigator.

Cost of Maintaining Minnesota Hospital Statistical Bureau

Basic cost estimates to carry out *minimum* program of service described above to *all* the hospitals of the state are as follows:

Tabulating machinery rentals	$3,600.00
Punched cards, paper and office supplies	12,000.00
Rental of office space.....	1,800.00

Personnel—		
(a) Chief	$4,000.00	
(b) Secretary	1,200.00	
(c) Clerks	5,400.00	
		10,600.00
Total yearly upkeep		$28,000.00
Additional estimated yearly costs to spread into special studies and clearance of statistical matter for many of the social and welfare organizations		10,000.00
Permanent equipment essential—		
Typewriters, duplicators, furniture, files		3,000.00

Plan for Meeting the Estimated Cost to the Individual Hospital or Contributing Institutions

(a) Flat yearly minimum rate of $100.00 per year per institution for establishment of minimum plan.

(b) Assessment of all costs for materials in punched cards, paper and postage against institutions above an amount of $10.00 a year. This would mean that small institutions involved with minimum tabulations would have no extra costs while large institutions might have to pay an extra $50.00 or $100.00 a year for the materials required in fulfilling the minimum tabulations.

(c) Assessments at cost plus 10 per cent for all special tabulation studies made for institutions or Minnesota Hospital Association or outside organization (all of which would be cheaper than they could hope to do them individually).

(d) Contributions of the time of the hospital clerical record-librarian help to be paid for by the hospital in return for training of their record librarian personnel for a period of three to six months into the technique of machine tabulation, coding, cross-indexing, elementary statistics and computation. It is felt that this will link each hospital record department to the Minnesota Hospital Statistical Bureau with indispensable bonds of knowledge, personal contact, and common unity of training and purpose.

Plan for Meeting Cost During an Experimental Two-Year Period

Donation of space free of rental by the University Hospital while the Bureau is small.

Donation of approximately one-fourth of the time of Dr. H. L. Dunn, Director of the University Hospital.

Donation of a two-year fellowship, which is tentative at the present moment, but will probably be consummated before the end of March, which will pay $4,000.00 a year to an adequately trained worker to help lead the project.

Donation of all necessary punched card machinery and punched cards and the time of one worker for a year by the International Business Machines Corporation.

Donation of all necessary punched card machinery and punched cards and the time of one worker for a year by the Powers Accounting Machines Division of Remington Rand, Inc.

Donation by the U. S. government of five C.W.A. workers, an accountant, physician, secretary, and two clerks for card punching. This help is likely to continue for only a few weeks unless the C.W.A. program continues. There is a very good chance of getting some clerical help donated either by the University or the State in one form or another.

Since the project cannot go forward without some cash, it is anticipated that at least 30 to 40 hospitals will be willing to pay $100.00 per year from the start, and that some of the large ones will be willing to contribute for the sake of training purposes the part time of one of their clerical workers.

The program can be planned so that no institution will find it necessary to add to their clerical force or increase the expense within their organization to meet the needs of the Minnesota Hospital Statistical Bureau. It is possible that certain readjustments in duties and record procedures will have to be made.

The Relationship of the Program to the Record Librarian

The establishment of the Minnesota Hospital Statistical Bureau should result in a definite enrichment of the usefulness and a broadening of the horizon of the record librarian. Many duties such as cross-indexing, tabulation, registration file, monthly reports can be carried out in the central bureau. This will allow more time to be spent in bettering the original collection of data and in rendering more service to special administrative and medical studies. The record librarian will have the opportunity of obtaining training in the art of tabulation, the technique of mechanical tabulation, simple statistics and computation, and thereby become of more value to her hospital administrative and medical staff. It should definitely open the way for achievement and position in other fields.

drafting a sheet which they can use in common for the same purpose.

Any special data to be gathered on certain patients or in certain institutions can be noted on the back of the carbon copy which is sent to the Minnesota Hospital Statistical Bureau, and if so noted will be tabulated.

It might be desirable to go to some routine form of report to be filled in by each hospital and sent to the Minnesota Hospital Statistical Bureau rather than to use a carbon of the admission-discharge sheet. This would take extra clerical work and should be avoided if the routine admission-discharge sheet can be made to serve the purpose without further clerical work.

The hospital will receive monthly a printed list ordered by case number of the data which has been coded and punched on the patients discharged during the month. An example of how such a table would look is shown in Fig. 2, A and B. The example is a hypothetical one, and is involved with only a few patients supposed to represent January and February discharges. The list could be ordered in any other way desired but this arrangement would probably suffice for a monthly list. The data of each new month would probably be sorted into that of the preceding so as to make the year's work cumulative.

In Fig. 2A the first patient is M. S. MacLean, who is revisiting the hospital for the eleventh time. He was diagnosed to have disease 1278–3–– 1345–6–– and YX89–2––, which upon decoding proves to be neurasthenia, arthritis right knee and cholecystitis respectively. These diagnoses could be decoded either in the Minnesota Hospital Statistical Bureau or in the record room of the hospitals as they are needed. The address of Mr. MacLean is 495 Hamlin avenue south. He was admitted to the Out-Patient Department in January and discharged unimproved in January, 1934. His age is 45.

If we turn to Fig. 2B we can see that his laboratory work was all negative except for a positive BMR and x-ray. He was seen by physicians number 56, 51, 55 and 58, in departments number 71, 81, and 55. He has two dependents and no children. He came to the Out-Patient Department only four times. His occupation is 920, which decoded, means farm owner. He was charged $7.00 by the hospital.

The same information which is printed in the above form can be *rearranged* and printed in *any other form* that might be desirable at a very slight additional expense.

For instance, once a year it is anticipated that permanent diagnostic cross indices will be built for all major numbers. Fig. 4, A and B represent thirteen of the patients in the foregoing list who had major diagnoses YX89 (Diseases of the liver, gall bladder, and bile duct). These disease diagnoses are assembled and printed. Suppose the hospital physician wishes to know the cases of cholecystitis (YX892–––) which were complicated by appendicitis (YX782–––), he would find but one case, No. 75691, Mr. A. Mackay, who had both conditions. If he wished to know what physicians or surgeons saw him, he could glance at Fig. 4B and see that it was physicians No. 19, 25, and 38.

Fig. 3 is a sample table to illustrate the manner in which a confidential file could be kept in the Minnesota Hospital Statistical Bureau in order to clear the overlapping institutional admittances of patients who visit several institutions. Such a file would become of particularly great value if it could be used to extend the functions of the various confidential exchanges and make them state-wide in character. In particular, such a file is needed if state-wide hospital morbidity statistics are to be of value. Patients with chronic illnesses are frequently hospitalized in a number of hospitals during the same year. Such a patient diagnosed for the same condition in several institutions should be counted as only one case if the morbidity statistics are to give an accurate picture of the number of such illnesses which are hospitalized. A complete state-wide picture of hospital morbidity statistics would offer considerable information with reference to the frequency of such morbidity conditions in the community.

Beyond these basic tabulations the services of the Minnesota Hospital Statistical Bureau would probably become special for each institution, depending on their individual needs and willingness to pay excess charges for such services. It is to be hoped that in time a considerable volume of research and special tabulation could extend the service and its usefulness to the medical investigator.

Cost of Maintaining Minnesota Hospital Statistical Bureau

Basic cost estimates to carry out *minimum* program of service described above to *all* the hospitals of the state are as follows:

Tabulating machinery rentals	$3,600.00
Punched cards, paper and office supplies	12,000.00
Rental of office space.....	1,800.00

Personnel—		
(a) Chief	$4,000.00	
(b) Secretary	1,200.00	
(c) Clerks	5,400.00	
		10,600.00
Total yearly upkeep		$28,000.00
Additional estimated yearly costs to spread into special studies and clearance of statistical matter for many of the social and welfare organizations		10,000.00
Permanent equipment essential—		
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Ultimate Goal and Purpose of the Program

Although there is every indication that this program can be sold to the hospitals of the state in terms of dollars and cents from the standpoint of hospital administration, the broader usefulness of its achievement is worth the cost of the effort.

(a) It should link the hospitals of the state into a closer functional unit and help them present a more united front against the forces in the existing economic system which tend to destroy them.

(b) It will make available for the first time generalized hospital morbidity statistics. These will be of increasing value from the public health and social standpoint.

(c) It will make possible immediately the extension of hospital morbidity statistics to a national scale under the auspices of the American Hospital Association or the United States Public Health Service simply by duplicating essential punched cards and sending them to Washington.

(d) It will offer a powerful medium for standardization in all types and processes of hospital administration and medical records.

APPENDIX I

The punched card machinery is handled in a large measure by two companies, the Powers Accounting Machines Division of Remington Rand, Inc., and the International Business Machines Corporation.

The machines of both companies utilize cards of identical size, shape and thickness, Figure 5 being an example of the 45-column card.

Cards can be obtained in different desired colors and stripes for file identification purposes.

The International also have a card of the same size, shape and thickness as the one shown in Fig. 5, but having an 80-column capacity, while the Powers have a card of 90-column printing capacity.

Essentially the two types of equipment are the same, the principal difference being that in the International machine the information punched in a card is contacted electrically, while in the Powers machine, this information is contacted by means of mechanically actuated levers. The card, when going through the International machine, has its information taken off one horizontal row at a time; the cards passing continuously through the machine. In the Powers machine, the card stops momentarily and all horizontal and vertical positions may be contacted simultaneously.

The punched holes shown in the card illustration (Fig. 5) are produced mechanically by punch machines (illustrated in Fig. 6A and 7A). Each company has perfected sorting machines (Fig. 6B and 7B) which sort and order the punched cards at a speed of from 400 to 450 cards per minute. Both companies also have perfected printing machines (Fig. 6C and 7C) which will print and add information according to the holes which have been punched in the cards. Printing speed is between 75-100 cards per minute. Both companies carry special equipment which is adaptable for various purposes.

In order to obtain a printed list of the data on the punched cards, the International makes use of a "plug board" which translates the punched holes to printed information, while the Powers makes use of the "multiple translator" which serves the same purpose.

Both companies rent their equipment on a monthly basis and have fixed rates for punched card costs.

APPENDIX II

All codes can be divided into general codes and those which are special for each institution. A general code consists of those codes which can be used in common by different institutions.

Codes to Be Used in the University

Hospitals punched cards (Figs. 8 and 9) are as follows:

1. *Punch* — *Month*

Y	December
X	November
O	October
1	January
2	February
3	March
4	April
5	May
6	June
7	July
8	August
9	September

2. *Punch* — *Year*

Y	
X	
O	1940
1	1941
2	1942
3	1943
4	1934
5	1935
6	1936
7	1937
8	1938
9	1939

3. *Punch* — Number of Dependents or Children, Physicians and Surgeons or Departments and Clinics

Y	12+ and over.
X	11
O	10
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

4. *Punch* — *Race*

Y	
X	
O	Indian
1	White
2	Colored
3	Others
4	Hebrew
5	American
6	North American—Canada
7	Foreign Europe, Except Russia
8	Foreign Oriental (Asia, Africa and Russia)
9	Foreign South America, Mexican

5. *Punch* — *Other Hospitals*

Y	
X	
O	
1	
2	
3	In county, elsewhere in state and outside of state.
4	In state, out of county in which hospital is located and outside of state.
5	In county, outside state.
6	In county, elsewhere in state.
7	Out of state.
8	In state, out of county where hospital is located.
9	In county.

6. Occupation Code (This code will be three columns but has not yet been made.)

7. *Punch* — *Admission Type* (As in col. 22 for printing.)

Y	
X	
O	
1	
2	
3	
4	
5	
6	
7	Free, charity, out-patient, and in-patient.
8	Out-patient.
9	In-patient.

8. Sub-Filing (Number of punched card.)

9. *Punch* — *Geographical*

Y, X, O, 1, 2	County within state by geometric code.
3, 4, 5, 6, 7, 8, 9	State and countries of world by geometric code. (Not yet made in detail.)

10. *Punch* — *Admission Number* and Type as in col. 26.

Y, X, O, 1, 2	Admission number by geometric code. (16, 8, 4, 2, 1)
3	
4	
5	
6	Hand listing necessary for some item on card.
7	Out-patient and in-patient.
8	Out-patient.
9	In-patient.

11. Case number direct punching.

12. Institution assignment by geometric code number under county code.

13. Filing.

1	All cards listed.
2	All cards listed carrying over capacity of first card. For example, if there were 7 diagnoses there would be a duplicate of cards 2, 3, 4, 5 and 6 made with 2 punched in col. 34. Cards 1 and 7 would have a secondary card with diag. 6 and 7, punched in where diag. 1 and 2 are now indicated. (See Fig. 8 and 9.)

14. Admission number. Straight punch of admission number up to 29. If the case is technical discharge to make the year's fiscal statistics balance, the numbers will be punched 31 to 59 instead of 1 to 29. If the case is a yearly recheck discharge the numbers will be punched 61 to 89 instead of 1 to 29.

15. Eligibility.

Y	
X	
O	
1	County.
2	Pay.
3	Private.
4	H. Service.

5
6 Free charity.
7 Free teaching and research.
8 Free staff.
9 Free Eustis.

16. Age, direct punching.

17. Dept. or Clinic—Special code for each institution.

18. All laboratory tests.
Y Positive for one or more tests.
X Negative for all tests.
O Tests not done.
1, 2, 3, 4, 5, 6, 7, 8, 9 } Number of tests (by geometric code).

19. Sex and civil state.
Y
X
O Male civil state not specified.
1 Male single.
2 Male married.
3 Male widowed.
4 Male divorced or separated.
5 Female civil state not specified.
6 Female single.
7 Female married.
8 Female widowed.
9 Female divorced or separated.

20. Material or item code (in process of being built).

21. Item unit (in process of being built).

22. Col. 21 in card 7.
Y, X, O, 1 } Trip to Op. R. (Geometric Code) 8, 4, 2, 1
2, 3, 4, 5 } No. of Surg. (Geometric Code) 8, 4, 2, 1
6, 7, 8, 9 } No. of Diag. 8, 4, 2, 1

23. Condition on discharge and death.
Y
X
O
1
2
3 Left against advice.
4 Death after discharge from hospital.
5 Death in hospital with autopsy.
6 Death in hospital with no autopsy.
7 Unimproved.
8 Improved.
9 Recovered.

24. Diagnosis and surgical nomenclature and codes.

A number of nomenclatures for diagnosis and surgery are available and have been used in various places. The most commonly used are listed as follows:

(a) Nomenclature of diseases by Royal College of Physicians, London.
(b) A Standard Classified Nomenclature of Disease by National Conference on Nomenclature of Disease.
(c) Standard Nomenclature of Diseases and Pathological Conditions, Injuries and Poisonings for the U. S. by Department of Commerce, Bureau of Census.
(d) Nomenclature of Diseases and Conditions, Treasury Department, U. S. Public Health Service.
(e) Bellevue Hospital Nomenclature of Diseases and Conditions.
(f) Massachusetts General Hospital Classification of Diseases.
(g) Ponton's Nomenclature of Diseases and Operations.

The number system of any one of these nomenclatures may be used in this punched card plan. It would be necessary to adapt the number system in any one of the nomenclatures by concentrating the major number of the nomenclature through the device of multiple punching into one major diagnosis column. This can be done for all of the above listed nomenclatures.

The number system of this plan has been taken from the coding scheme of the Mayo Clinic nomenclature in the hope that it will be printed in the near future and be available for general use. It is desirable that each hospital staff adopt some one nomenclature list within which they will be willing to confine their terminology. The code number used for diagnosis or surgery in the Minnesota Hospital Statistical Bureau will in no way interfere with the choice of the nomenclature most suitable for the needs of any certain hospital staff. If no nomenclature is used there will be a continued residue of terms that cannot be coded or listed because they are ambiguous in meaning.

25. The Geometric Code is described in detail in the Journal of the American Statistical Association, Sept., 1932, pp. 279-286.

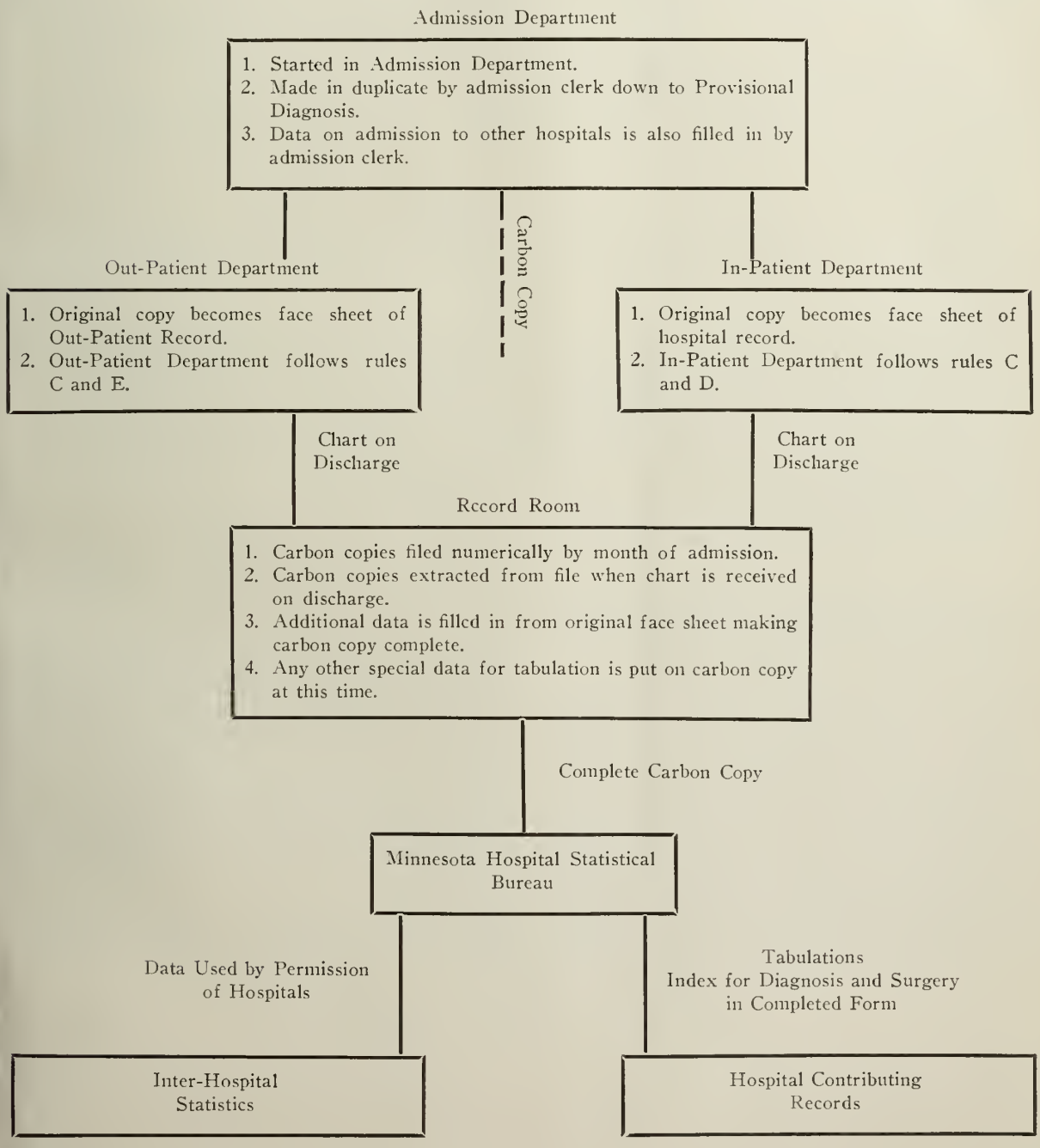
APPENDIX III

The Registration-Discharge Sheet, as illustrated in Fig. 10, is now in use in the University Hospital. It is the result of considerable thought and co-operation on the part of a number of physicians, in particular Dr. S. R. Lee of Ancker Hospital, St. Paul. It has been worked out with considerable care in the hope that a routine collection of data, for the patient's record, will suffice simultaneously for the statistical needs of tabulation, thus resulting in no increase of clerical work within the institution. Any institution adopting this sheet can automatically come ino the benefits of the Statistical Bureau without further adaptation.

The rules in force for this sheet are given as follows:

COMPLETE INSTRUCTIONS FOR THE USE OF THE REGISTRATION SHEET

A. Flow Chart—Description of Route Taken By Registration Sheet in Hospital and Out-Patient Department



B. Rules for Admission and Discharge and Re-Registration

(a) If patient is taken in by the Out-Patient Department and transferred to the hospital on the same day, it is to be stated as Admittance 1. ..... H. ..... with appropriate admission date.

(b) If patient is taken in by Out-Patient Department and held two or more days, it is to be recorded on the same case record sheet as

Admittance 1. ..... O. .....
1. ..... H. .....

with appropriate dates for admittance and discharge.

(c) If patient is taken in by Out-Patient Department and transferred to hospital and back to Out-Patient care, it is to be recorded as per following examples:

Adm. No.	Adm. Type	Adm. Date	Disch. Date
1	O	Nov. 1, 33	
1	H	Nov. 1, 33	Dec. 1, 33
1	O		Dec. 8, 33

(d) There will never be more than one Hospital Admission for any admittance number and only one admittance number for each registration sheet. The Hospital Discharge is automatic when the patient leaves the hospital even though he may be asked to return to the hospital at a later date, in which case a re-registration must be made at the time of the next admission to the hospital.

(e) Patients are discharged from the Out-Patient Department at final diagnosis and completion of treatment by staff.

(f) Patients in the Out-Patient Department can be discharged to the hospital.

(g) One year from the last previous admission the patient is to be discharged for re-registration by staff who is to make at this time, an actual, provisional or deferred diagnosis.

(h) Re-registration.

1. A new registration sheet is made out for each new admission number.

2. No patient is allowed to continue as an active patient for more than one year without being re-registered. Therefore all carbon copies remaining in the open file in the Record Room one year after the month of the original admission on the registration sheets, whether they are Out-Patient Admissions or Hospital Admissions, are to be taken from this file and the cases automatically considered completed and ready for cross-indexing. This period of clearance will vary between eleven and twelve months. For example, on June 30 all cases still filed under the original registration month of July of the previous year will be cleared regardless of the day of July on which they were registered.

3. Once a case has been discharged and cross-indexed, the patient must be re-registered if he returns at a later date.

C. Rules for Staff

(a) Provisional diagnoses are to be filled in by the physician at the time of the first examination of the patient in the Admission Department. If the case does not go into the Admission Department the provisional diagnoses should be made at the time of the first contact with the patient in the hospital.

(b) Diagnoses are to be cross-indexed from the section of the sheet headed "Clinical, Surgical, Pathological Diagnoses to Be Indexed." Therefore, write your diagnoses so that they are complete but brief and in a form suitable for cross-indexing. When it is desired to elaborate upon the diagnostic possibilities, write on this sheet only the diagnoses to be indexed and write further comments regarding diagnoses on the Supervisory Staff Sheet as a part of the discharge note.

(c) Diagnoses should be filled in as soon as made. This applies particularly to diagnoses made in consultation. Diagnoses should be completed at the time of discharge which includes discharge (or transfer) from one service to another as well as discharge from the hospital or clinic. Be sure to record the date of diagnosis and your name. For hospital patients the diagnoses and statement of discharge together with the date and name of the staff physician who has authorized the discharge, must be placed on the Registration Sheet in the section headed "Clinical, Surgical, Pathological Diagnoses to Be Indexed" *before the patient is allowed to leave.*

(d) Any diagnoses may be qualified as to the degree of sureness of the diagnosis. The qualification may be noted in percentage as 75% (probable), 50% (doubtful), 25% (questionable).

(e) A diagnosis of incomplete may be made for the following reasons: Failed appointment and a yearly automatic discharge rule which has been introduced for the purpose of systematic indexing.

(f) A diagnosis of indeterminate is acceptable if symptoms and findings are named as conditions to index. Such as "indeterminate jaundice," "indeterminate pain," R. U. Q., "indeterminate vomiting," etc.

(g) The department to which the patient is admitted is responsible for his discharge in the Out-Patient Department and in the hospital except when a transfer has been made. The department discharging the patient is responsible for looking over the record, instructing the patient, and checking the completeness of the diagnoses to be indexed on the registration sheet.

(h) The date and fact of final discharge and the name of the physician making the discharge of the patient should always be indicated on the Registration Sheet following the diagnoses in the section, "Clinical, Surgical, Pathological Diagnoses to Be Indexed."

(i) A cross-index of the patients seen by any staff member, intern, or clerk will be set up for him if he will take the trouble to write his name in the space designated "Special Data."

D. Instructions for Nurses

(a) Nurses are to fill in the section of the registration sheet relating to departmental transfers.

(b) Whenever a patient leaves a service, it is to be considered a discharge from that service whether the patient leaves the hospital or is transferred to another service. If the patient is transferred to another service, this constitutes admission to a new service and both discharge from the old and admission to the new must be made out by the nurse on the discharging service.

(c) The discharge date from the service is to be filled in by the nurse at the time of discharge from the service. When a patient is transferred from one service to another, the discharge date for the first service and the admission date for the second are identical but both entries must be made.

(d) When a patient is transferred from one station to another but is retained on the same service the "Ward-Station-Days" column must be filled in at the time of the move. When the patient is discharged from the second station, that station number and number of days is to be written in below the first.

(e) The name of the staff physician (not intern or fellow) in charge of each service is to be written in the column "Responsible Staff Member."

(f) The "intern" column need not be filled in.

E. Instructions for Out-Patient Department

(a) The department to which the patient is admitted is responsible for his discharge except when a transfer has been made.

(b) When patients are referred to special clinics, it is the duty of the special clinic to either give an appointment slip, which can be definite or indefinite, or to stamp the general dispensary chart as "finished" in that special clinic. If a stamp of "finished" is placed on the general dispensary chart, the staff of the special clinic is obliged to write either an opinion or a diagnosis. When the special department, to which the patient has been referred, is finished with the patient, it is the duty of the nurse or secretary of that department to tell the patient that he is finished in that special department and check whether the patient knows what other departments he is to see and if he has no further appointment elsewhere, to be sure that he returns for final opinion to the admitting department. This opinion must likewise be placed in continuity on the general dispensary record regardless of what special forms the special department has of its own. The opinion might consist merely of a statement of "negative." Any diagnosis made by the special department must be placed on the front of the registration sheet.

(c) The department discharging the patient is responsible for looking over the record, instructing the patient, and checking the completeness of the diagnoses to be indexed on the registration sheet.

Illustrations for Paper on PROSPECTUS OF MINNESOTA HOSPITAL STATISTICAL BUREAU



By Halbert L. Dunn, M.D., Ph. D.

Director, University Hospitals

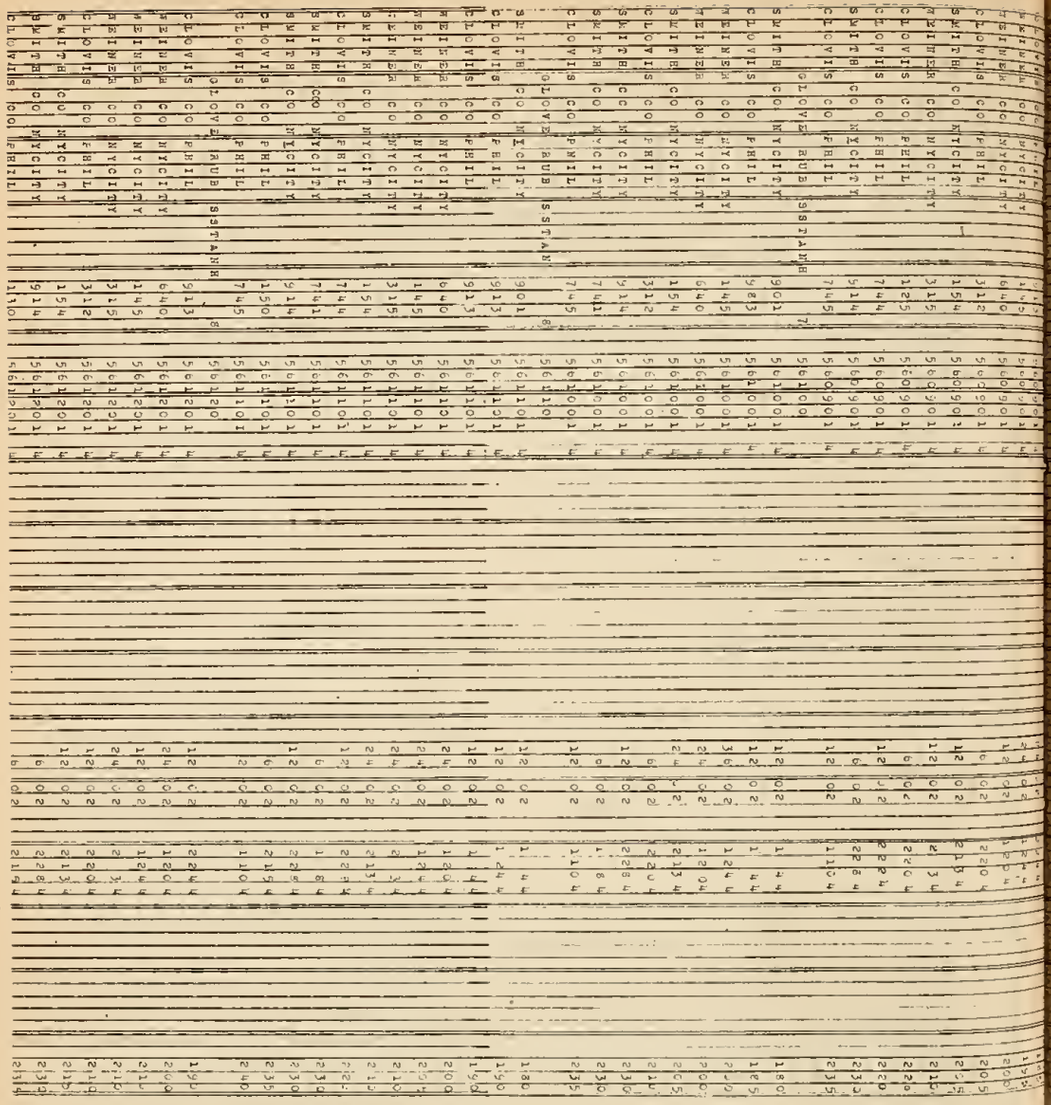


Fig. 1

These data have been made up as a hypothetical example.

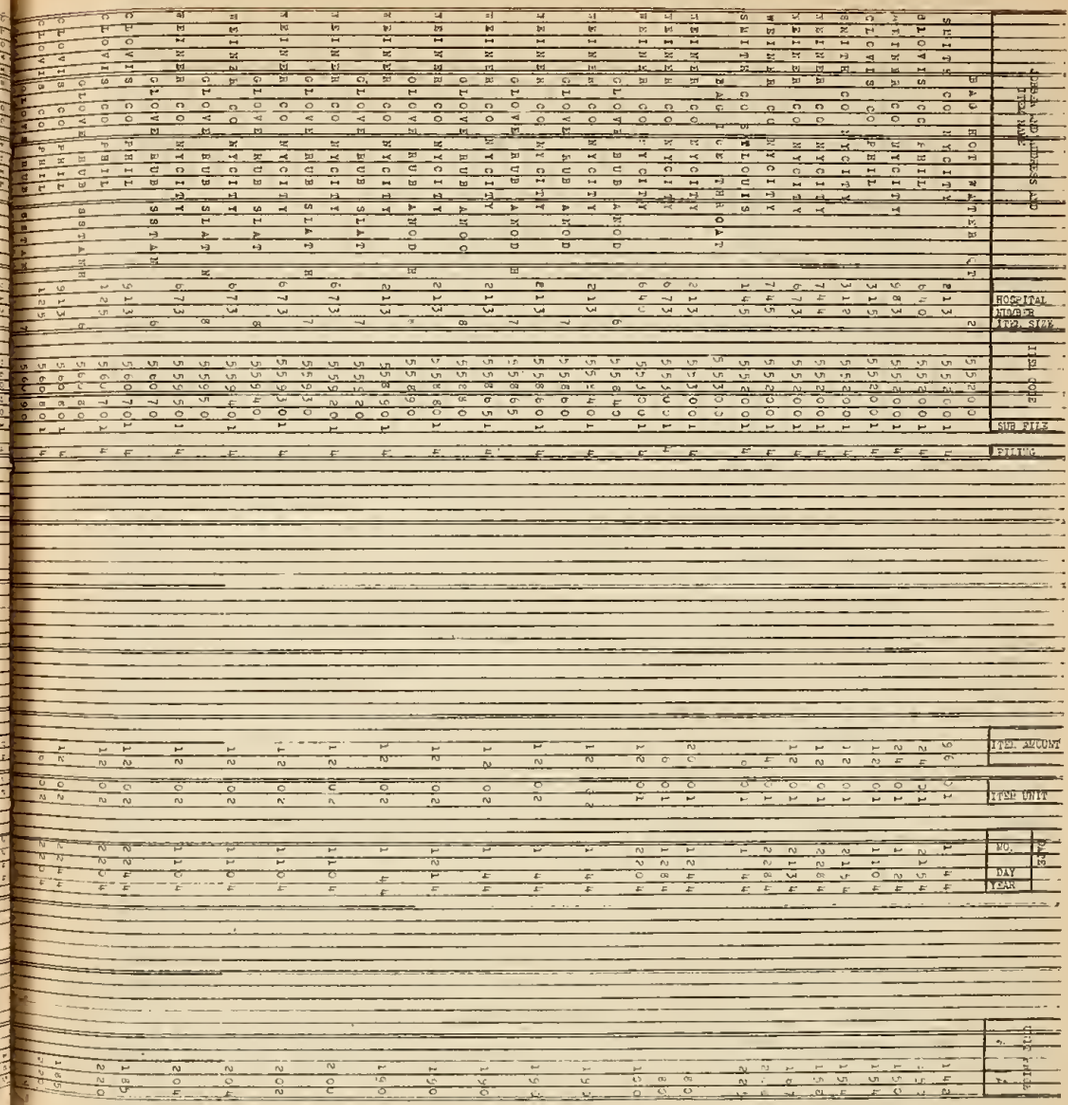


Fig. 1

Clearance Purchase Information for January and February 1934.

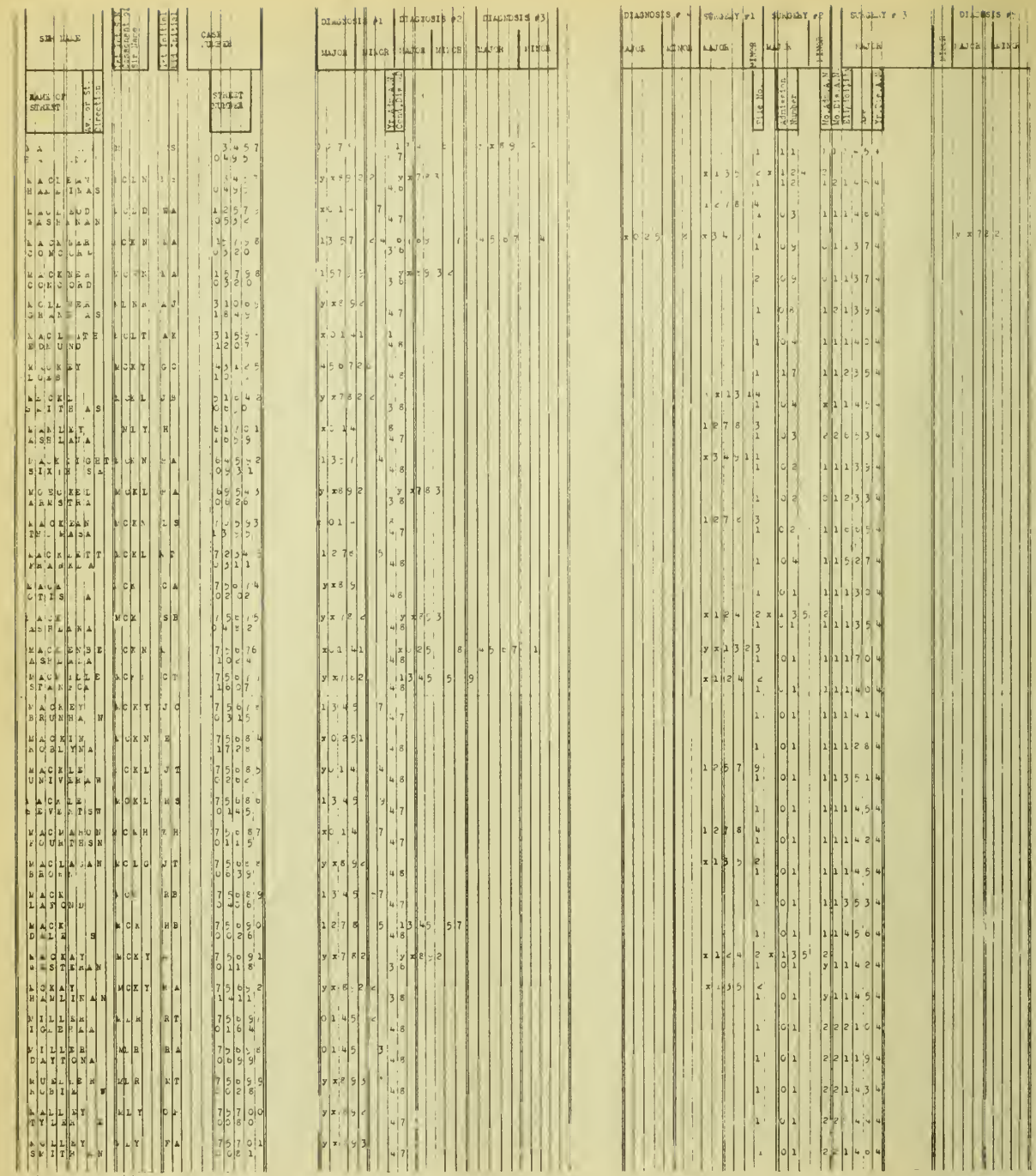


Fig. 2-A. Data from punched cards #1, 3, 4 and 7 (see fig. 10).

January and February Discharge Report of University Hospital Patients ordered by case number.

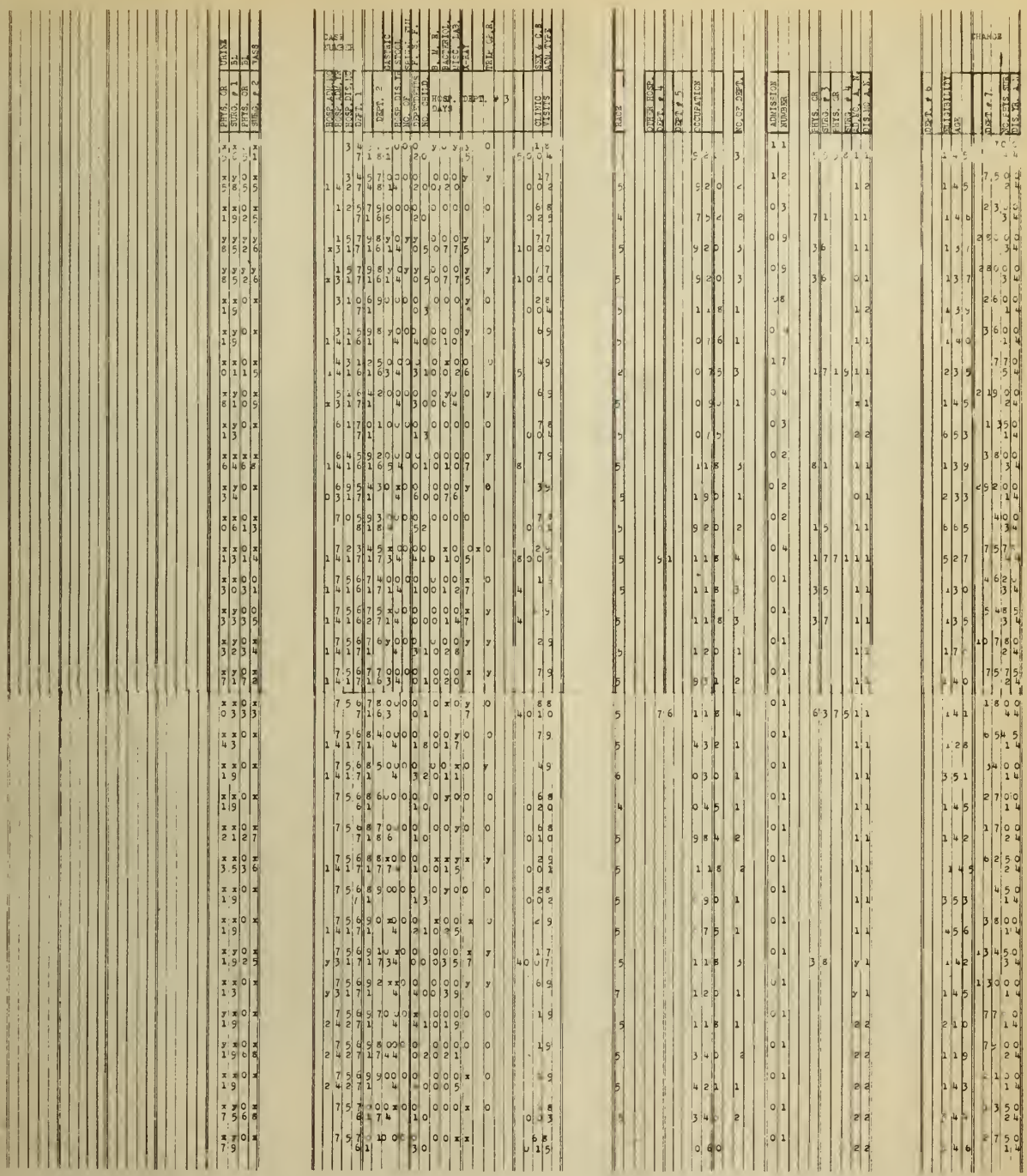


Fig. 2-B. Data from punched cards #2, 5, 6 and 8 (see fig. 10).

This report is for purposes of illustration only and the case data are hypothetical.

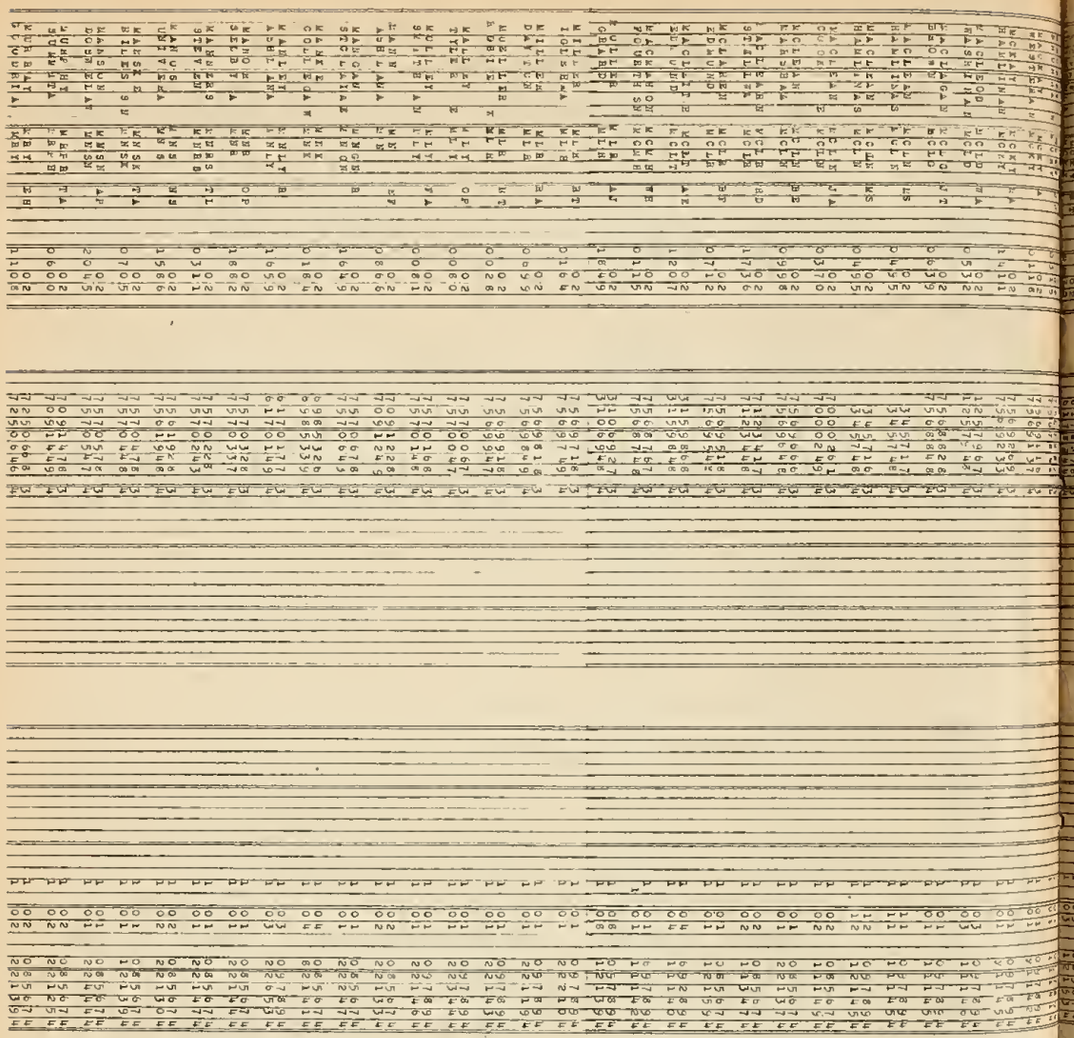


Fig. 3.

Sample of central confidential file which could be used to clear facts of admissions or discharges of patients to various institutions.

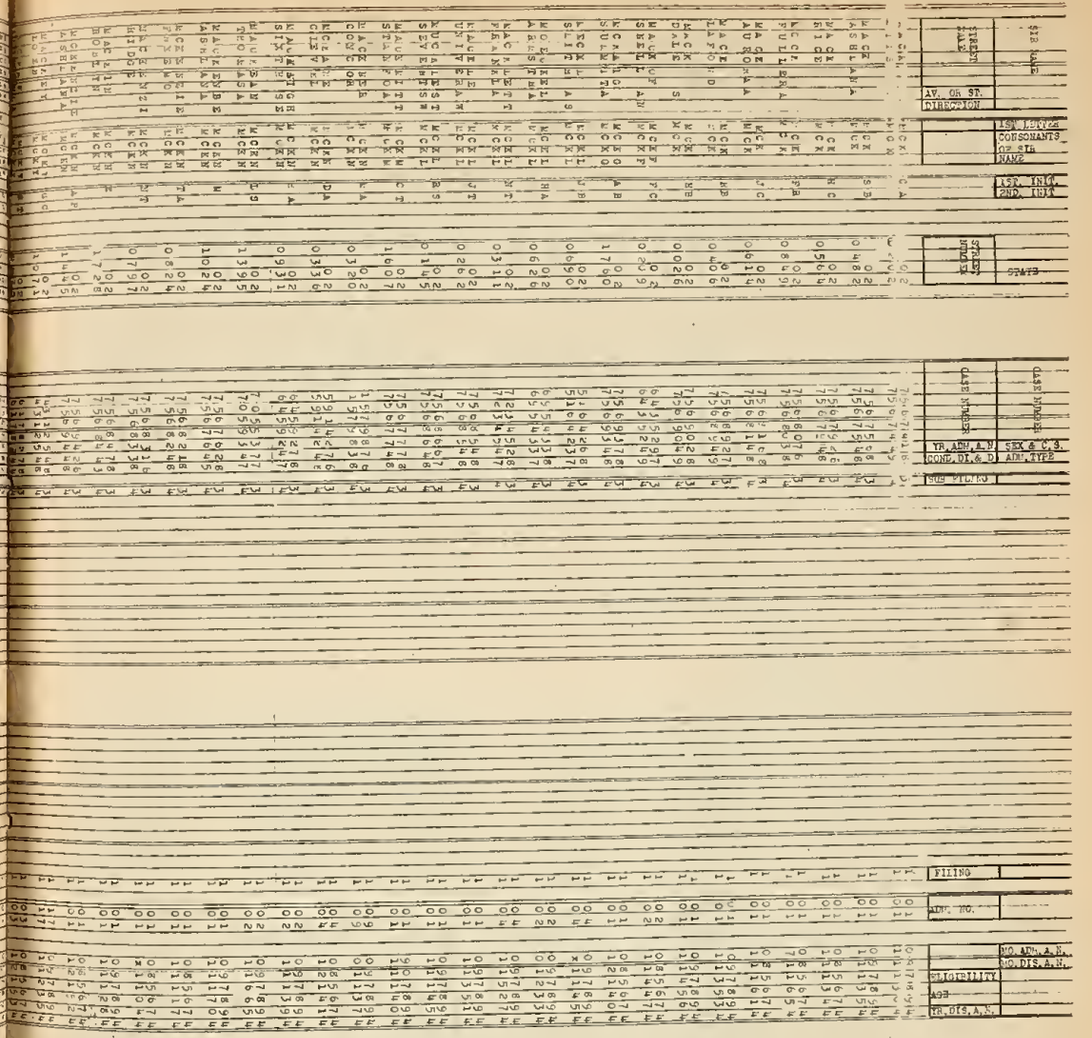


Fig. 3.

(Once again this example is hypothetical only two hospitals being represented.)

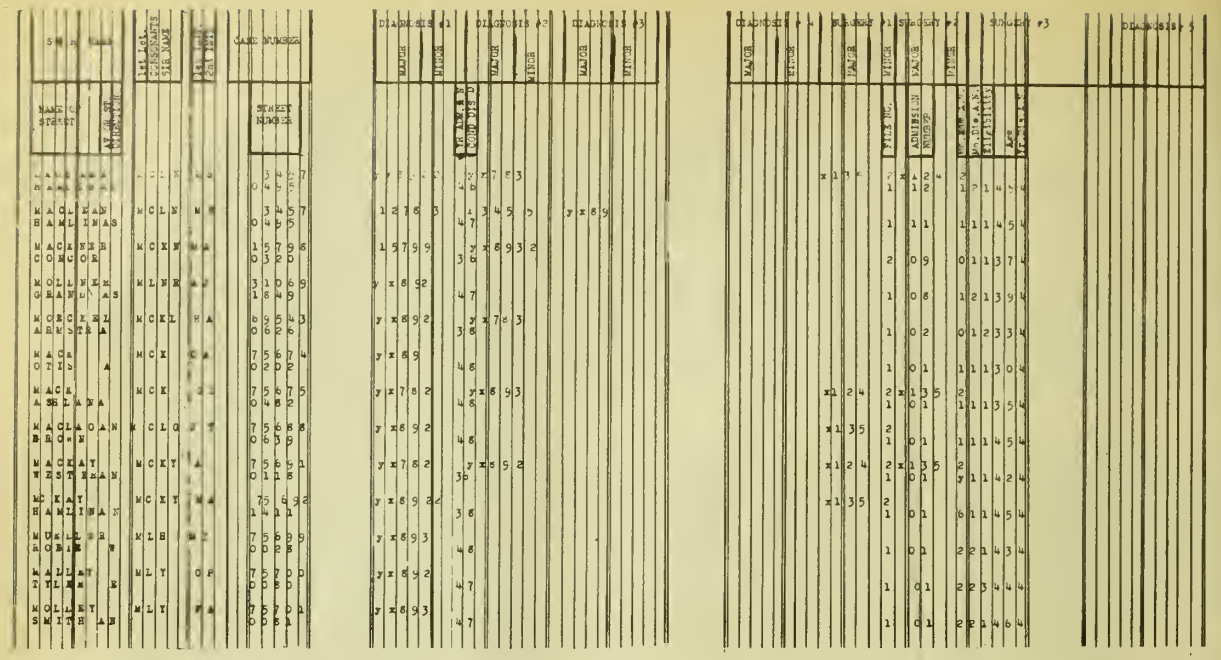


Fig. 4-A. Data from punched cards #1, 3, 4 and 7 (see fig. 10).

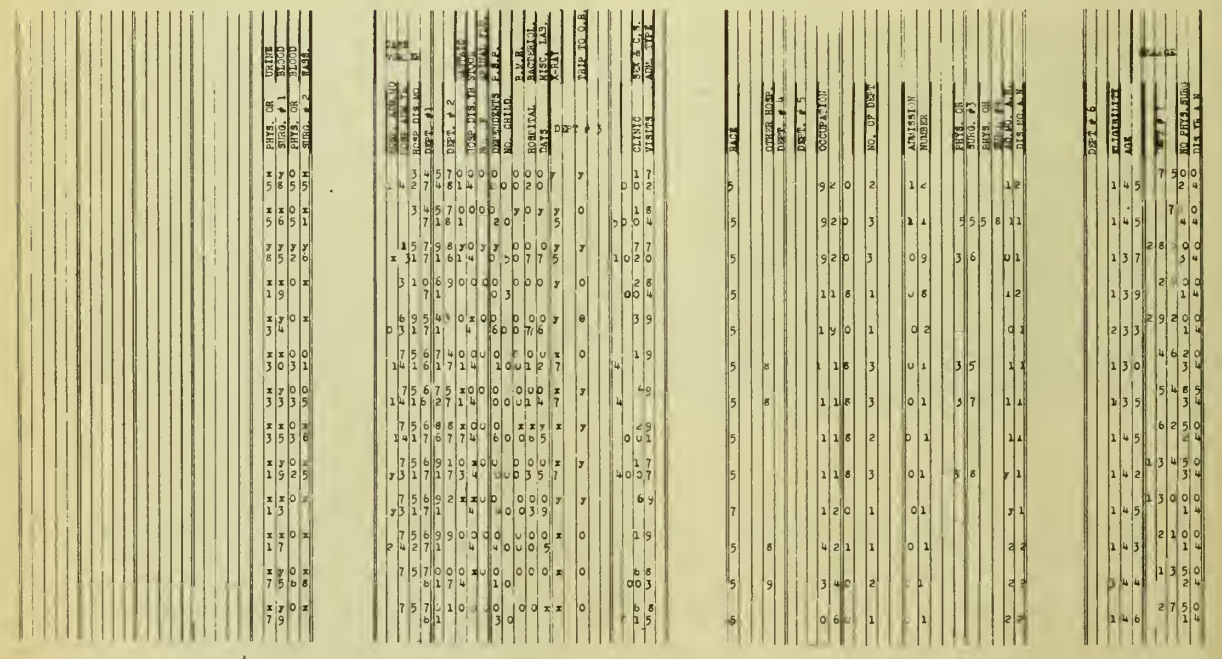


Fig. 4-B. Data from punched cards #2, 5, 6 and 8 (see fig. 10).

Sample of cross index book, to be brought up to date annually, in which information is relisted under Major Diagnosis Number. Same hypothetical data have been used as in figure 2 for those patients diagnosed Major Diagnosis 7 x 89 (Diseases of Liver, Gall-Bladder and Bile Duct Diseases).

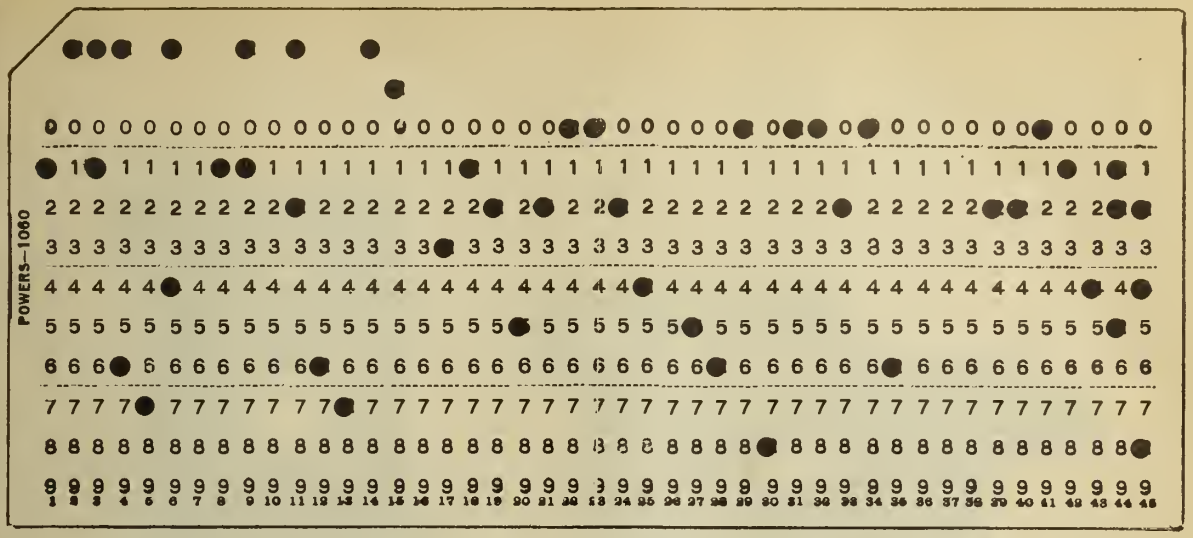


Fig. 5.

Sample of plain 45 column punched card with holes punched.

International Business Machines Corporation.



Fig. 6-B. Electric Sorting machine.

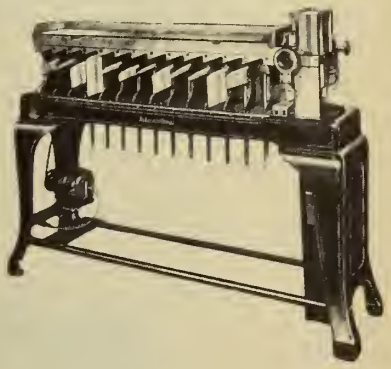


Fig. 6-A. Electric key punch.

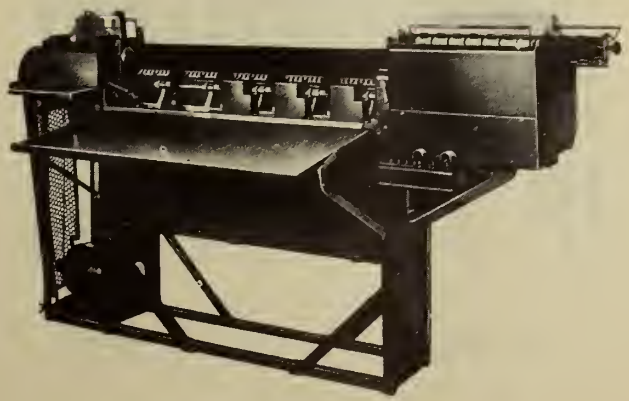


Fig. 6-C. Electric accounting machine.

Powers Accounting Machine, Division Remington-Rand, Business Service, Inc.

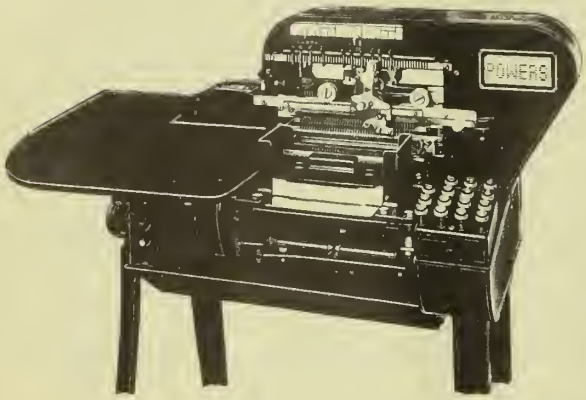


Fig. 7-A. Automatic key punch.

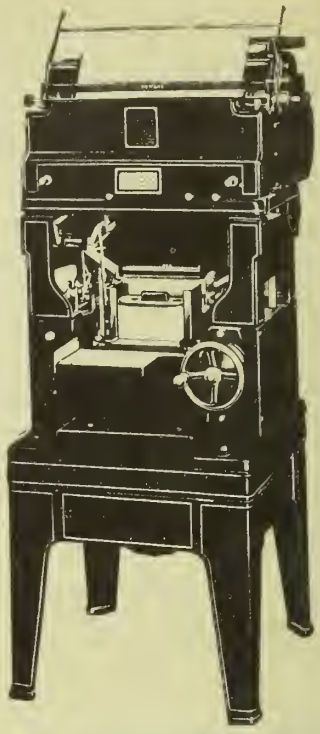


Fig. 7-C. Alphabetical tabulator.

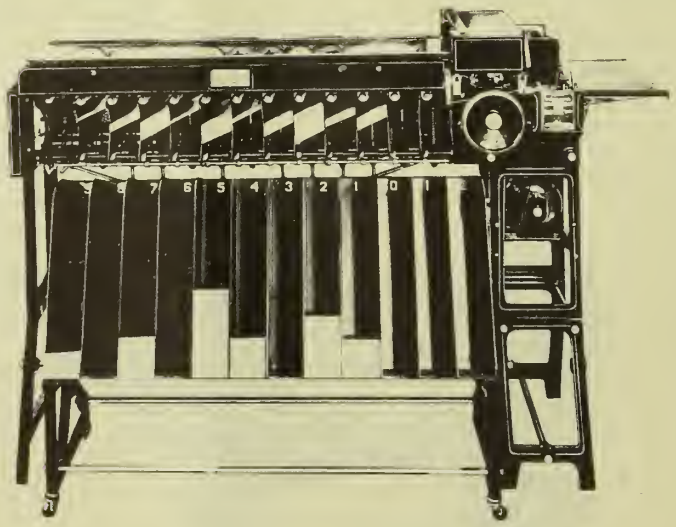


Fig. 7-B. Standard sorter.

Punch card for University Hospital as indicated on Special Code Sheet.

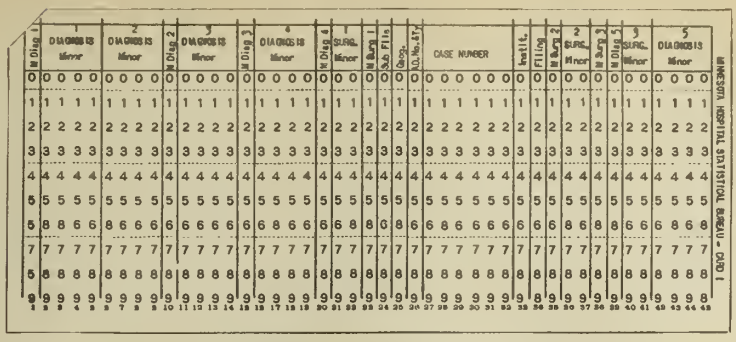


Fig. 8-A. Card 1 Diagnosis and Surgery, Major and Minor

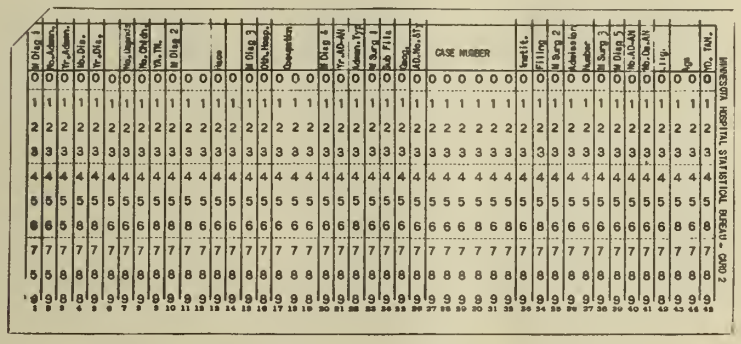


Fig. 8-B. Card 2 Basic data

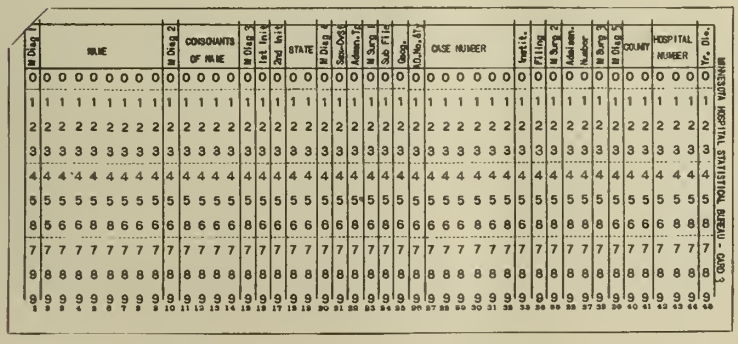


Fig. 8-C. Card 3 Name data

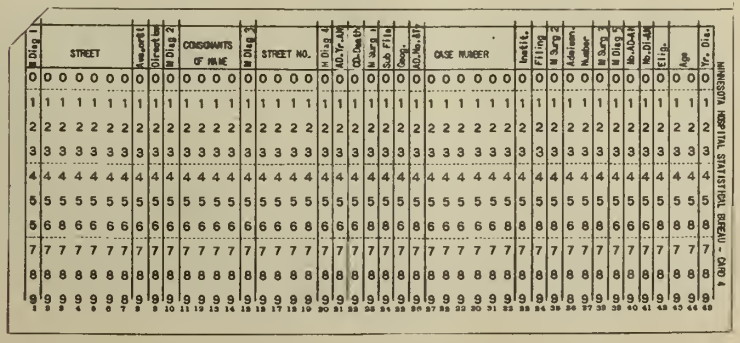


Fig. 8-D. Card 4 Address data

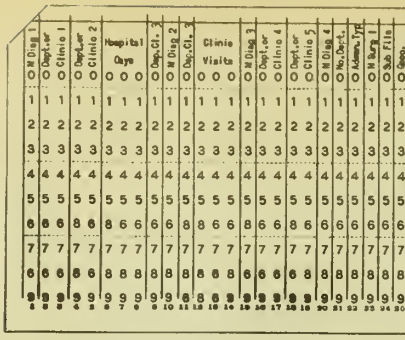


Fig. 8-E. Card 5 Department data

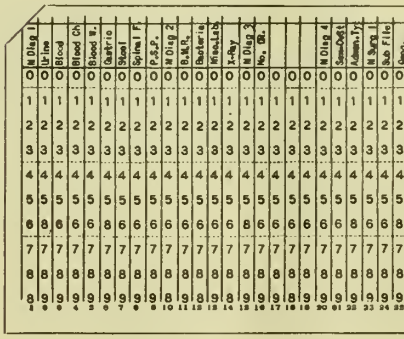


Fig. 8-F. Card 6 Laboratory data

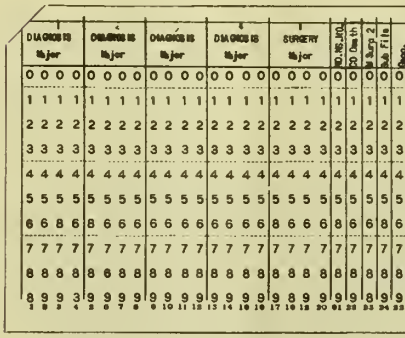


Fig. 8-G. Card 7 Diagnosis and Surgery, Major (for printing).

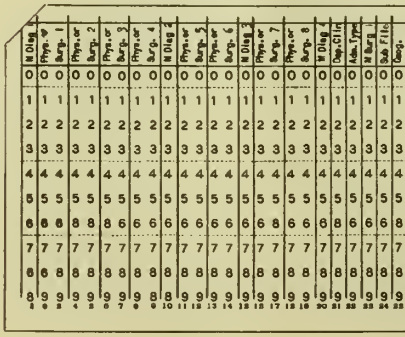


Fig. 8-H. Card 8 Item description

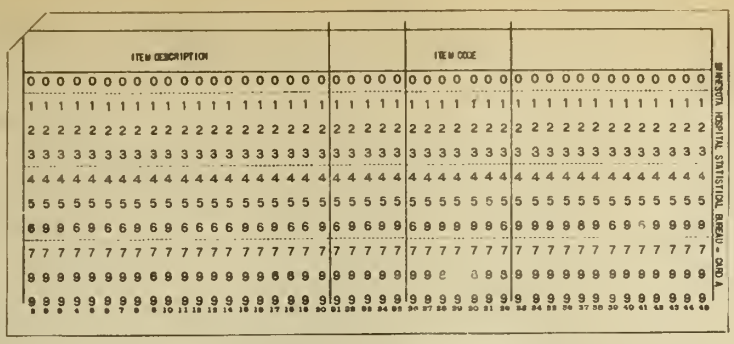


Fig. 8-I. Card A Item description

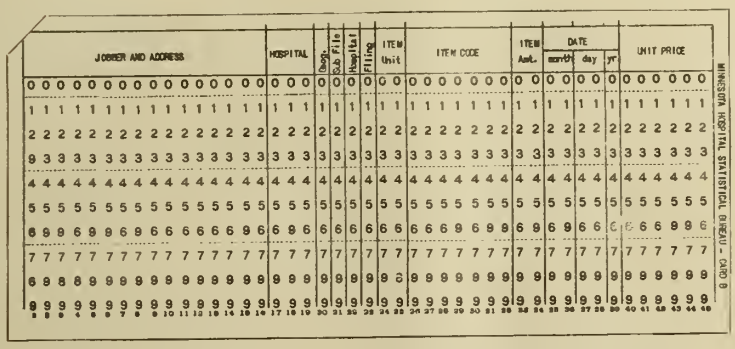


Fig. 8-J. Card B Purchasing Clearance

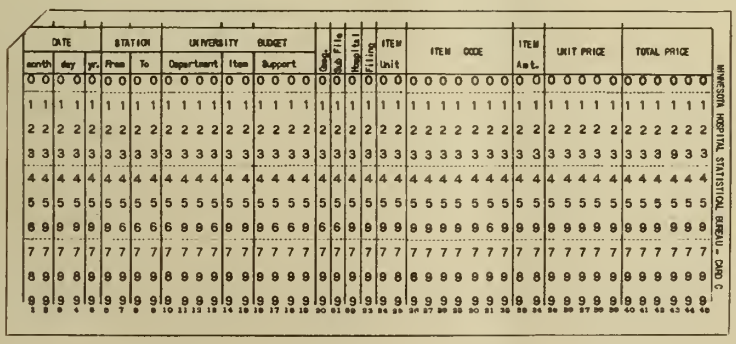


Fig. 8-K. Card C Cost Accounting

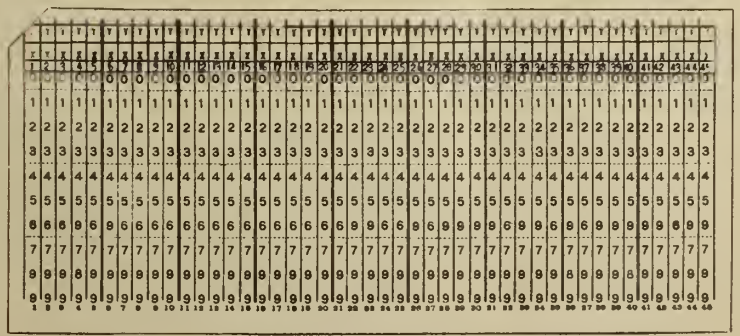


Fig. 8-L. General card used for all purposes. Actually, it is satisfactory to use this card instead of any of the above cards thus saving the expense and delay of new printing with additional cards.

Fig. 9 MINNESOTA HOSPITAL STATISTICAL BUREAU

Code Sheet for University Hospital _____ File no. _____

Punch Card Col.	Card #1	Card #2	Card #3	Card #4	Card #5	Card #6	Card #7	Card #8	Card "B"	Card "C"
1	Diagnosis #1 (Major - 4 punches)							Diagnosis #1 (Major)		
2	Diagnosis #1 (Minor)	Mo. Hosp. Adm.			Dept. or Clinic #1	Urine Ex.	Diagnosis #1 (Major)	Phys. or Surg. #1		Month
3		Yr. Hosp. Adm.				Blood Ex.				
4		Mo. Hosp. Disch.		Name of Street	Dept. or Clinic #2	Blood Chem.		Phys. or Surg. #2		Day
5		Yr. Hosp. Disch.	Surname			Wass.-Bl. Gr.				Year
6	Diagnosis #2 (Minor)				Hosp. Days	Gastric Ana.	Diagnosis #2 (Major)	Phys. or Surg. #5		Station From
7		No. of Dependents				Stool Ex.				
8		No. of Children		Ave. or St.		Spinal Fl.		Phys. or Surg #6	Jobber and Address	Station To
9				Direction	Dept. or Clinic #3	P. S. P.	Diagnosis #3 (Major)			
10	Diagnosis #2 (Major - 4 punches)							Diagnosis #2 (Major)		Univ. Budget (Dept.)
11	Diagnosis #3 (Minor)		First Letter		Dept or Clinic #3	B.M.R.		Phys or Surg. #7		
12			and Consonants of Surname		Clinic Visits	Bacteriol.				
13		Race				Misc. Lab.	Diagnosis #4 (Major)	Phys. or Surg. #8		
14						X-ray				Univ. Budget (Item)
15	Diagnosis #3 (Major - 4 punches)							Diagnosis #3 (Major)		
16	Diagnosis #4 (Minor)	Other Hosp.	1st Initial	Street Number	Dept. or Clinic #4	Trip to Op. Room		Phys. or Surg. #9		Univ. Budget (Support)
17		Occupation	2nd Initial				Surgery #1 (Major)		Hosp. No.	
18			State		Dept. or Clinic #5			Phys. or Surg. #10		
19										
20	Diagnosis #4 (Major - 4 punches)								Geographical	
21	Surgery #1 (Minor)	Yr. Adm. for this Adm. No.	Sex & Civil St.	Yr. Adm. for this Adm. No.	No. of Depts or Clinics	Sex & Civil St.	No. Diag., Surg., & Trips to Op. Rm.	No. of Dept. or Clinics	Subfiling	
22		Adm. type		Cond. on Disch. Death	Adm. type		Cond. on Disch. Death	Adm. Type	Institution	
23	Surgery #1 (Major - 4 punches)						Surgery #2 (Major)	Surgery #1 (Major)	Filing	
24	Subfiling								Item Unit	
25	Geographical									
26	Admission Number and Type (Geometric code) & Hand Listing								Item Code	
27-32	Case Number									
33	Institution (Geometric code)								Item Amount	
34	Filing									
35	Surgery #2 (Major - 4 punches)						Surgery #2 (Major)	Surgery #2 (Major)	Month	Unit Price (Dollars and Cents)
36	Surgery #2 (Minor)	Adm. No.						Adm. No.		
37									Day	
38	Surgery #3 (Major - 4 punches)						Surgery #3 (Major)	Surgery #3 (Major)		
39	Surgery #5 (Major - 4 punches)							Diagnosis #5 (Major)	Year	
40	Surgery #3 (Minor)	Mo. Adm. for this Adm. No.	County	Mo. Adm. for this Adm. No.	Dept. or Clinic #6	Charge (Dollars and Cents)		Phys. or Surg. #3	Unit Price (Dollars and Cents)	Total Price (Dollars and Cents)
41		Mo. Disch. for this Adm. No.		Mo. Disch. for this Adm. No.						
42	Diagnosis #5 (Minor)	Eligibility	Institution No.	Eligibility	Dept. or Clinic #7		Diagnosis #5 (Major)	Phys. or Surg. #4		
43		Age		Age						
44					No. of Phys or Surg.			No. of Phys. or Surg.		
45		Yr. Disch. for this Adm. No.						Yr. Disch. for this Adm. No.		

Fig. 9

Special code sheet for University Hospital.

Adm. No.	Adm. Type	Adm. Date	Dis. Date
9	O.P.	10-5-33	11-2-33
9	Hosp.	11-2-33	1-18-34

UNIVERSITY OF MINNESOTA HOSPITALS
MINNEAPOLIS, MINNESOTA Reg. No. 15798

Name: Mackner Mrs. Mary A. (John) Age 37 Sex F Civil State M No. Clinics Visited 3 Number of Clinic Visits 20 Hosp. stay 77
Address: 320 Concord, Anoka Co. Henn. Occupation Patient: Housewife.
Refer by: Dr. Brown, Anoka, Minn. Occupation Resp. Party: Laborer - C.M.St.P. R.R.
Patient requests letter to—Name: John Jones Address: Chatfield, Minn. Number of Children 5 Number of Dependents 6 Eligibility D
Birthplace: Preston, Minn. Date of Birth: 9-10-1896 Length of residence in Co. 15 City 15 State 37 U.S. 37
Former Residence: Northfield, Minn. Nationality American Race White Religion Prot.

	Name	Birthplace	Address	Tel. No.	Dead Alive
Father	Adam Smith	Chicago, Ill.			Dead
Mother Maiden Name	Sarah Brown	St.Paul, Minn.	5660 Maryland St., Osage, Ia.		
Husband or Wife	John Mackner	Decorah, Iowa	320 Concord	Anoka, Minn.	

Relative or friend to be notified—Name: Mr. John Mackner (Husband) Address 320 Concord, Anoka Tel. No. 2450
Insurance: None Fraternal Organizations: None
Request for Admission by: C.W. Johnson Brought by: Car Brought from: Home

Provisional Diagnoses: 1. Pregnancy 2. Appendicitis 3. Cardiac Decompensation

	Adm. Date	Dept. or Service	Dis. Date	Days	Responsible Staff Member	Interne	Ward	Station	Bed
Admitted	11-2-33	O.B.	11-16-33	14	K		44		14
Dept. Transfer	11-16-33	Medicine	1-18-33	63	W		31		59
Dept. Transfer							21		14
Dept. Transfer									
Dept. Transfer									

Special Data:

Admissions to other Hospitals

Name	Location	Yr.	Diagnoses and Treatment Received (indicate hospital)
St.Marys, Cresco, Ia.		1910	Acute rheumatic fever

Date	Consultant	Clinical, Surgical, Pathological Diagnoses to be Indexed
10-5-33	C	Pregnancy. Cardiac Decompensation
10-10-33	W	Nephritis Chronic, Lues Latens, Appendicitis? Cholecystitis with Cholelithiasis ?
11-2-33	L	Delivery - Induced Labor - Low forceps
11-7-33	C	Lobar Pneumonia - Rt.
1-18-34	C	Discharged

University of Minn. Hosps. Form 5
Minneapolis, Minnesota 2-34-5M

Fig. 10-A. Front of sheet.

Urine Examation	+	4
Blood Examination	+	12
Blood Chemistry	+	6
Blood Wasserman	+	12
Gastric Analysis	+	2
Stool		0
Spinal Fluid	+	2
P.S.P.	+	2
B.M.R.		0
Bacteriology		0
Misc. Lab.		0
X-Rays	+	4
Trips to Operating Room	+	1
Charge $ 280.00		

Fig. 10-B. Back of sheet.

Registration-Discharge Sheet in use at University Hospital adopted for the use of the general hospital. This sheet is made out in duplicate, the original sheet being used in the patient's record and the carbon for Statistical Bureau.

The Development of the Modern Hospital*

Arthur H. Sanford, M.D.†
Rochester, Minn.

IT IS AXIOMATIC that an account of the development of the modern hospital is also a story of the development of modern medicine. Scientific medicine had its origin in the hospital of yesterday as a teaching and research institution, and our conception of the requirements of the hospital of today is based solely on the requirements of that type of medical thought that was evolved in those hospitals of yesterday. The evolution of both modern medicine and the modern hospital is coincidental with the part of the evolution of modern civilization.

It is customary in discussing the hospital as a humanitarian institution, to refer to its antiquity, and the fact that centuries before the Christian era the schools of medicine, managed as they were by pagan priests, and as part of a health cult, or religion, had accommodations for the housing, and sustenance of its devotees. Then with the spread of Christianity through the Western World by the Roman Empire, the care of the sick by the Church was part of religion. That civilization for nineteen centuries owes much to the Church, in the fostering of learning and in the care of the sick, is an accepted fact. It is customary in this connection to refer also to the development of the very name "hospital" from the Latin, *hospitium,* meaning stranger, through the French words *hôpital, hospice,* and *hôtel,* meaning as they do an institution for the care of the sick guest, the well guest, or merely the travelling public, and yet the "Hôtel Dieu" wherever found is always a hospital in the accepted sense, maintained by a religious order.

There are a few modern hospitals that trace their origin to medieval times, such as St. Bartholomew's Hospital in London. The history of such an institution would tell the whole story. However, the unfolding of such a story would be influenced by the development of hospitals of much more recent origin. For instance, Guy's Hospital in London, now only a little more than two hundred years old, founded by a bachelor pilanthropist had in its origin so much that was then modern that this hospital might be taken as the example of the modern hospital, and in tracing its development the story might be told. Certainly Guy's Hospital Reports, published now for a century, contain a most fascinating account of growth of medical teaching, by such masters as Bright, Addison, and Hodgkin. But in the United States and Canada there are institutions, of still more recent origin, that have added so much to the development of the modern hospital, that one is tempted to think of the present day system of the care of the sick, as practiced in America, as being a product of American life.

The first hospitals in the New World, that are still in existence at any rate, are in Canada. In Quebec, the Hôtel Dieu de Précieux Sang de Quebec, was founded by the Duchesse d'Aiguillon, niece of Cardinal Richelieu, in 1638, on the spot where it stands today. The founder called to her aid the Augustinians of Dieppe, an order founded in the twelfth century who traced their origin to the first community for women founded at Hippo in the year 423 by St. Augustine. The hospital is now conducted by the order of Hospitaliéres de la Miséricorde de Jesus, who also conduct the General Hospital of Quebec. This latter institution was originally a monastery built in 1621 by the Recollets, four of whom came from France in 1615 with Champlain. In 1693 the property was turned over to the above named order of nuns, for the care of the aged and sick.

In Montreal is the third oldest hospital in America, the Hôtel Dieu of Saint Joseph. This was founded by Mlle. Jeanne Mance, called "The Florence Nightingale of America." She arrived at the Island of Montreal in 1642, built a hospital, which was sixty by twenty-four feet in dimensions, in 1644. This was chartered by Louis XIV in 1669; this historic document is still in the possession of the hospital, which had grown from thirty-two beds before 1825 to three hundred beds at the end of 1926.

In the United States, we all know of the Philadelphia General Hospital and its claims for priority. This very modern institution grew out of the Philadelphia Almshouse, established in 1732, also known as Blockley Almshouse, being in Blockley township. Beginning in 1920, new build-

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*This paper especially prepared for the HOSPITAL NUMBER of THE JOURNAL-LANCET.

ings were added until in 1931 a modern municipal hospital, now known as the Philadelphia General Hospital, has taken the place of old "Blockley," dear to the hearts of many of the older generation of medical men. The history of this institution might be taken to tell the story of the development of the modern hospital.

So, also, might the story be told of the well known Bellevue Hospital of New York, which now has 2,069 beds, and 103 bassinets. In 1736 was founded the "Public Workhouse and House of Correction of the City of New York," built for eighty pounds sterling and fifty gallons of rum. The first building was fifty-six by twenty-four feet. In an upstairs room was an infirmary twenty-five by twenty-three feet "to be used for no other purpose whatever," containing six beds. The first medical officer, John Van Beuren, with a salary of one hundred pounds annually, supplied his own drugs and instruments. The present site of Bellevue, so fitly named, was purchased for $10,000 in 1794. A new Bellevue establishment was built in 1816, with separate hospitals for male and female inmates. The penitentiary was later moved to Blackwell's Island and then followed a number of necessary changes. In 1861 was opened the Bellevue Hospital Medical College, which was later united with the New York University Medical College, and in 1902 the New York Legislature created the Department of Bellevue and Allied Hospitals comprising Bellevue, Harlem, Fordham and Gouverneur Hospitals. In the history of these institutions as provided in the metropolis of America, the story of the development of the modern hospital might be read. However, in the minds of others the story of Massachusetts General Hospital, the oldest hospital in New England and the third oldest in the United States, would take first place. The cornerstone for the present institution was laid July 4, 1818. The use of the institution for teaching medical students is known to us all. Here ether anesthesia was demonstrated to the surgical world October 16, 1846, and here Oliver Wendell Holmes coined the word "anesthesia" itself. Here also Reginald H. Fitz coined the word "appendicitis."

Then, besides these great institutions in the eastern United States should be mentioned the great Charity Hospital of New Orleans, the Cincinnati General Hospital, and Mercy Hospital in Chicago. "Charity," owned by the state of Louisiana, had its inception in a small hospital of five beds through the gift of $2,500 by Jean Louis. A new "charity hospital" was established in 1786 by Don Andres Almonaster y Rojas. It would seem from these dates that this institution antedates the Massachusetts General Hospital. However, it was not until 1834 that the Daughters of Charity of St. Vincent de Paul took charge. It is to their tireless efforts that the present institution owes its growth to 1,756 beds, and fifty-three bassinets, and no institution in the country can offer the medical student a greater variety of interesting material for observation than can "Charity."

The Cincinnati General Hospital represents the beginning of medical teaching in the middle west, as since its inception in 1823 it has been constantly affiliated with some medical school. The present magnificent establishment comprises twenty-five buildings, situated on twenty-seven acres, houses 865 patients, and represents a capital outlay of $4,000,000.

In Chicago, modern hospital history begins with Mercy Hospital. The Sisters of Mercy came to Chicago in 1846 when Chicago was nine years old. From 1849 to 1866 Mercy Hospital in the old Lake House was the only hospital in the state of Illinois. The present location at Twenty-sixth Street and Calumet Avenue, became the home of "Mercy" in 1869. Destroyed by the fire of 1871, it was rebuilt and the beginning of the modern Mercy Hospital was made all over again. Along with this institution might be mentioned one especially famed for the medieval history of the order which established it, namely, the Alexian Brothers' Hospital. This hospital for male patients only and staffed only by men, has been maintained from 1866 in Chicago by this order of brothers which had its origin in Europe in 1357. Brother Bonadventure was sent from Aix-la-Chapelle to Chicago for the purpose of founding this unique institution.

Too much space may have been taken in the mere naming of some of these older institutions. It must be remembered that none of them became "modern," however, in the accepted sense until the last fifty years when there was stimulated all over the country a most astounding growth in the number of hospitals.

In Minnesota, most of the hospitals have been built within the last fifty years. There are several, however, that are more than fifty years old. St. Joseph's Hospital, in St. Paul, has a remarkable history of eighty years. It was founded by four Sisters of St. Joseph Carondelet in 1853. Before the first building of timbers cut on the present site of Minneapolis was finished, they cared for a number of cholera patients in the little log church built as St. Paul's by Father Gaultier in 1841. In 1857, Christ Church of St. Paul founded St. Luke's Hospital. General H. H.

Sibley was president of the hospital board from 1873 until his death in 1890. The City and County Hospital, now Ancker Hospital, has a history of sixty-two years. The first state hospital for the insane was established in St. Peter in 1866. It now has 2,037 beds. The Rochester State Hospital, with 1,526 beds, was opened in 1877 as an asylum for inebriates. Soon after it was changed, however, to a hospital for the insane. Up to 1866 the insane were committed to institutions outside the state. In Minneapolis, the Right Reverend David Buell, of Gethsemane Church founded St. Barnabas Hospital in 1871. It was first known as "Cottage Hospital." The Northwestern Hospital was organized in 1882 by a group of earnest women. Because of a peculiar bequest made by Honorable L. M. Stewart, only women physicians were permitted on the staff until recent years. Men physicians were employed as "assistant doctors" until the stipulation was set aside by legal methods. The Minneapolis General Hospital dates from 1887. In Duluth, St. Luke's Hospital was opened in 1882 by St. Paul's Protestant Episcopal Church, and St. Mary's Hospital in 1888 by the Sisters of St. Benedict. The same order, Sisters of St. Benedict, had opened a hospital in St. Cloud in 1885. St. Mary's Hospital, at Rochester, Minnesota was opened in 1889 by the Sisters of St. Francis of the Congregation of our Lady of Lourdes, six years after the destructive cyclone which emphasized to the citizens their great need for such an institution. In connection with this hospital was subsequently developed The Mayo Clinic. Then the allied hospitals owned by the Kahler Corporation were built, and The Mayo Foundation for Medical Education and Research, an integral part of the University of Minnesota, was established.

Modern surgery begins with the knowledge of bacteriology, and the almost immediate development of methods of sterilization, first of culture media in the laboratory, then of instruments and dressings in the operating room. Pressure steam sterilization of surgical materials has a history of about forty years, and makes a facinating story in itself. The control of the fearful mortality resulting from infection following operation has probably done more to interest the public in the advantages of hospitalization of their sick loved ones than any other advance.

And thus, in the unfolding of this flower of modern times, we find that in the minds of the people there is an entirely different attitude toward the hospital. The older institutions that I have named were almshouses, or asylums. Here the indigent, the stranger, and the maniac were cared for, chiefly as much to remove them from society as for humanitarian reasons. The dignity of nursing as a profession for women received great impetus, as is known from the example of the "Angel of the Crimea," Florence Nightingale. With every well regulated hospital now maintaining a school for nurses, this profession for women has completely changed the method of caring for the sick. However, it must never be lost sight of that the Roman Catholic Church, through its orders of nuns, first offered this nursing care, and in the numerous institutions still maintained by these orders, modern methods of nursing are not only practiced, but were for the most part developed. Mention may also be made of the care of the insane, for the most part in State institutions. The name of Dorothea Dix will ever live in this connection. She was born April 15, 1802 in Hampden, Maine. Her early life was none too happy. When she was thirty-nine years of age she began a single-handed crusade that lasted for forty years. She was one of the most remarkable women that the United States ever produced. Lincoln recognized this by making her Chief of Union Army nurses during the Civil War. But, in the face of public apathy, if not opposition, she created an agitation that resulted in the state care of the insane in nearly all of the leading States of the Union. The treatment of the insane, even in some of the institutions that have been named, was deplorable, and in this type of hospital the development of modern methods makes a wonderful story all in itself. More than 40 per cent of the hospital beds in the United States are devoted to the care of patients with nervous and mental disease.

About 50 per cent of the hospitals in the world are now in the United States. The modern hospital as it is now recognized, as an institution which can be and must be standardized, is really a product of the twentieth century. This age of specialization in medicine has seen an enormous increase in the intricacies of hospital building and management. Twenty-five years ago the trend was toward building institutions with many units covering many acres of ground. To erect such an institution required literally miles of water pipes, drains, gutters, steampipes, and electric wires. There was even the suggestion that as time went on, the small hospital village might be developed from its inception into a "hospital city" to be located in the country away from the true city. Such an institution, it was suggested, could be independent, provision being made within itself for all of the functions of care of

its staff as well as of its patients. This type of institution did not develop, however, on any large scale, and today the "skyscraper" building plan may be noted. In a number of larger cities now, the hospital has followed modern American architectural trends, and has gone up in the air, instead of spreading on the ground. The most noteworthy example of this in the United States, or in the world for that matter, is in the Columbia-Presbyterian Medical Center in New York City. Here are combined a number of institutions. The dominating building of the group, the Presbyterian Hospital, is twenty-two stories high. Three floors are occupied by the Sloane Hospital for Women, and one floor by the Squier Urologic Clinic. Housed in the lower buildings which complete the center are found the Presbyterian Institute of Ophthalmology, The Vanderbilt Clinic, the Babies' Hospital of the City of New York, the Neurological Institute of New York, the New York State Psychiatric Institute and Hospital, and the College of Physicians and Surgeons. While this vast institution may at this time represent the "ultra-modern," the hospital architect of the future doubtless will utilize much that is embodied therein in his plans for a modern hospital.

With specialization there have grown up many special departments. The Out-patient department for treating ambulatory patients has become a most important part of the hospital as a medical center; so also the Social Service department. Here the economic situation of the entire family may be studied, and helpful adjustments made in the patient's own home. This department calls for a separate corps of well-trained workers, and instruction to novices in this work becomes a function of this department of the hospital. So, too, there is the Occupational Therapy department with its specially trained workers. The rehabilitation of those who may be partially or permanently incapacitated for their usual occupations is here carried out. In the institution caring for patients with mental disease, this work is now considered of prime importance in treatment. The keeping of the records of the hospitals has assumed such proportions that most modern hospitals now have record librarians for such duties.

In the development of the modern hospital, there has also been developed the scientific side of medicine. Indeed, it may be true that the modern hospital, with its roentgen-ray laboratories, its pathologic laboratories, and its diagnostic laboratories has been developed to its present state by means of these features. In the last number for the year 1933 of the *Journal of the American Medical Association* under "Current Comment" is published an article entitled "The Clinical Pathologist as a Teacher." The first two sentences are as follows: "The evolution of the clinical laboratory in the modern hospital constitutes one of the remarkable advances of the present century. The hospital laboratory is often the axis about which the scientific work of the institution revolves." I am more familiar with the development of this specialty in modern medicine than with other features. In fact, the modern clinical laboratory and the clinical pathologist as a specialist have been developments of the past quarter-century. The discovery of the advantage of serologic methods in diagnosis gave the first great impetus to laboratory development following the discoveries in bacteriology of half a century ago. Since the great growth in laboratory work brought about by the invention of the Wassermann test, and the subsequent improvements in serologic methods, there has developed an enormous interest in what is now called biochemistry and biophysics. The physiologist and the physiologic chemist in their researches are constantly giving to the clinical pathologist new methods that can be applied in laboratory diagnosis. Although there never was a greater demand for the well-trained clinical observer and diagnostician, and for the skilled and experienced surgeon, the modern hospital is also now judged for standardization on its equipment for scientific investigation. Much has been said about "standardization." There have sprung up many organizations to aid in such standardization. The radiologists, as specialists, have their organizations, as do also the clinical pathologists, in the American Society of Clinical Pathologists. Then there are the American Occupational Therapy Association, the Association of Record Librarians of America, the American Sanatorium Association, the American Nurses' Association, the American Protestant Hospital Association, the Catholic Hospital Association of the United States and Canada, the American College of Physicians, the American College of Surgeons, the Canadian Hospital Council, the Department of Hospital Service of the Canadian Medical Association, the Council on Medical Education and Hospitals of the American Medical Association, and the American Hospital Association. All of these organizations, and there are probably many others, are concerned in some way with standardization in the hospitals in the United States and Canada, to say nothing of similar organizations in foreign countries.

Finally, the attitude of the public toward this institution, developed for him when sickness overtakes him, must be mentioned. The so-called "layman" has always had the most to do with this institution. Whereas the old hospital was to be shunned, and was merely a place of refuge for the poor, the modern institution is eagerly sought for by the wealthy who demand the best that modern science can give, but above all else that great middle class, that has always represented the best of any nation, has accepted the modern hospital as his special haven of refuge for the relief of suffering. He is not a pauper, nor can he afford the attention demanded by the prince. But he is willing and anxious to provide, for himself and for his relatives, the necessary care that the modern hospital affords. Perhaps the most striking example of this in the last twenty-five years is in the use of maternity hospitals, or the maternity department of the general hospital, for normal confinement cases. What the future may bring in the development of the hospital cannot be foretold. But what the policy for such development will be can be stated, as it has been definitely established. Whatever the relation of the hospital to society, and governmental agencies, whatever the relation of the physician to the state, the development of the hospital of the future will be, as was the development of the modern hospital, solely for the benefit of the patient.

FOOTNOTE

Historical data have been freely taken from "American and Canadian Hospitals," by James Clark Fifield with the cooperation of the American Hospital Association, 1933, Midwest Publishers Co., Minneapolis, Minn.

THE SOCIAL EQUATION: "IN RELATION TO HOSPITAL PROBLEMS"

(Continued from page 147)

which the writer and every physician and trained hospital worker ardently believes.

If those multiple influences which have contributed to the development of such a condition of mind in the indigent public have not been "paternalism" what have you?

But the mind of our Frankenstein is bi-lobed. There is more to be considered than just the fact that our Frankenstein cannot work and must be babied and diligently nursed and medicined for the slightest ailment.

The hospitals, and the hospital world, have preached not only service but quality of service—the same excellency of service to all mankind, be he millionaire or pauper. As for the hospitals themselves this beautiful ideal has come to be the basis of their existence. As for the public which the hospital world undertook to educate, it has been educated. And the mind of our Frankenstein may be sluggish, but it is tenacious. Hence, patients once cared for upon a charity service and recognizing its excellence do not turn readily back to private physician and paid hospital service with their accompanying inroads upon the pocketbook. It becomes an increasingly difficult problem to weed out the financially undeserving from the ranks of the applicants for service. All manner of subterfuges are resorted to. Bogus names are given. The name of an actually indigent relative may be substituted for that of the applicant. Persons from outlying districts, even from adjoining states where equivalent hospital facilities are not available, take up residence with a friend or relative in the city, a friend whose financial status has been such that he himself has received service from the institution, and by registering as a member of this friend or relative's family, admission to hospital free service is secured.

Our Frankenstein has begun to think, but he thinks sluggishly for he fails to recognize that such shrewdness as he is exercising must ultimately destroy completely that very service which he is scheming for and upon which he has grown to depend. At the same time the hospital world is awakening to the fact that it has created a nemesis for its own destruction if a solution of these problems is not soon arrived at.

The Working Principles of Hospital Standardization*

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THE primary purpose of the Hospital Standardization movement as sponsored by the American College of Surgeons during the past sixteen years is to surround the doctor and his co-workers with the proper environment in which he can be assured the best use of his own talents and have at his disposal all necessary adjunct facilities to assist him to the fullest extent in making a diagnosis and administering efficient treatment. To this end the founders of the Hospital Standardization movement based their recommendations on sound, fundamental principles which can be readily adapted to any type of institution caring for the sick and injured. These principles in their interpretation and application embrace every phase of hospitalization because the whole institution and not one unit or part alone is concerned in the ultimate service to the patient.

While good care of the patient is the primary concern of the Hospital Standardization movement there are other worthy objectives which must not be overlooked. The principles of Hospital Standardization when properly applied promote medical science through the medium of the hospital by affording practitioners of medicine a more enriching knowledge and experience as a part of their complete armamentarium in diagnoses and therapies. Through improving the organization and the proper utilization of its facilities and personnel, Hospital Standardization aids in, not only improving the service to each patient but also in enlarging its service to the community in the prevention of disease and promotion of research in scientific medicine.

If each hospital aspires to be of the greatest service to its patients, its medical staff, and the community at large it must incorporate into its organization the following ten working principles devolved in connection with the Hospital Standardization movement:

1. A modern physical plant, properly equipped for the comfort and scientific care of the patient.

2. Clearly stated constitution, by-laws, rules, and regulations setting forth organization, duties, responsibilities, and relations.

3. A carefully selected governing body having complete and supreme authority for the management of the institution.

4. A competent, well trained executive officer or superintendent with authority and responsibility to carry out the policies of the institution as authorized by the governing body.

5. An adequate number of efficient personnel, properly organized and under competent supervision.

6. An organized medical staff of ethical, competent physicians for the carrying out of the professional policies of the hospital, subject to the approval of the governing body.

7. Adequate diagnostic and therapeutic facilities with efficient technical service under competent medical supervision.

8. Accurate and complete clinical records filed in an accessible manner so as to be available for study, reference, follow-up, and research.

9. Group conferences of the administrative staff and of the medical staff to review regularly and thoroughly their respective activities in order to keep the service and the scientific work on the highest plane of efficiency.

10. A humanitarian spirit in which the best care of the patient is always the primary consideration.

Procedure Followed in the Hospital Standardization Survey

Provision is made by the American College of Surgeons for periodic surveys of all hospitals of 25 beds and over in the United States and Canada. To carry on this work the College maintains a competent group of field representatives, graduates of Class A medical schools, who possess a thorough training in clinical work and who understand the principles of hospital administration.

After a careful survey of the hospital in relation to the requirements and full consideration of the findings the hospital is rated according to one of the following classifications: (a) *Fully Approved*—the hospital having met all the requirements is carrying them out in an acceptable manner; (b) *Provisionally Approved*—the hospital having accepted the requirements is endeavoring to put them into effect but for lack of time or other acceptable reasons has not been

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*This paper especially prepared for the HOSPITAL NUMBER of THE JOURNAL-LANCET.

able to carry them out in full measure; (c) *Not Approved*—the hospital is not meeting the requirements. When an institution is Fully Approved for a sufficient length of time to guarantee its continuing to meet the requirements it is eligible for the Hospital Standardization certificate. If acute problems arise which are affecting the eligibility of the hospital at the time the Approved List is published the rating of that particular institution may be deferred for additional information and observation.

Each hospital is considered for rating annually. All hospitals come off the Approved List on October first each year and are immediately reconsidered for a new rating. The annual announcement of Fully Approved and Provisionally Approved Hospitals is made in October each year at the time of the Clinical Congress and Hospital Standardization Conference of the American College of Surgeons.

Granting Privileges to Doctors to Work in Hospitals

Due care should be exercised in granting privileges to doctors to work in approved hospitals. The governing body, aided by the medical staff, must guard this carefully. It is essential that there be some definite plan or procedure for investigating the eligibility of the applicant. This is best done by the following procedure: Each doctor desiring hospital privileges should submit a written application to the management of the hospital setting forth academic education, professional training and experience, membership in medical organizations, references, and other data which will assist in determining his qualifications. This application, when complete, should be reviewed by the medical staff or a duly authorized qualifications or credentials committee which makes recommendations to the governing body for appointment or other disposition of the case. The governing body, after considering all the data concerning the candidate, will pass officially on the application. In case of difference of opinion between the medical staff and governing body, a joint conference is indicated, when all details of the case may be reconsidered.

It is absolutely essential that irregular practitioners of medicine or those who are not graduates of acceptable regular schools of medicine be prohibited from working in approved hospitals. This is in accordance with Clause II of the Minimum Standard which reads in part as follows: "That membership upon the staff be restricted to physicians and surgeons who are full graduates of medicine with the degree of Doctor of Medicine, in good standing, and legally licensed to practice in their respective states or provinces...." There must be the strictest adherence to the policy of permitting only regular ethical graduates of medicine to work in approved hospitals, otherwise the institution cannot retain its place on the Approved List.

Medical Staff Organization

Good medical staff organization is essential in every progressive institution. It is extremely difficult to do scientific work without a well organized, actively functioning medical staff.

The first step in medical organization within the hospital is to determine the staff groups which may be possible and indicated. Though this varies considerably there are three main groupings generally found practicable:

1. *Consulting or Honorary Staff*—consisting of doctors who have gained a reputation of leadership in their work and are recognized, worthy, and outstanding.

2. *Regular Active or Attending Staff*—consisting of carefully selected physicians and surgeons outstanding in practice, specialized in their respective fields, and qualified to fill the various important positions on the medical staff.

3. *Associate, Visting, or Courtesy Staff*—consisting of ethical, competent practitioners in the community or nearby who are acceptable to the hospital administration and are allowed full use of the pay wards providing they abide by the rules, regulations, and policies laid down by the attending staff.

Further amplification of the regular active or attending staff may be made as deemed advisable.

In the organization of the medical staff the usual officers are: Chairman, or chief of staff; vice-chairman, or assistant chief of staff, and secretary. The following committees are desirable: (a) Executive, (b) Qualifications or Credentials, (c) Efficiency, (d) Records, (e) Program. As many as possible of the medical staff should be kept interested in committee work in order that they may become more familiar with the medico-administration of the institution.

Of major importance in good medical staff organization is departmentalization or differentiation into the various specialties. Division into departments fixes responsibility more definitely and stimulates greater scientific interest in the clinical specialties. If the hospital is small and there is little or no specialization among the profession in the community departmentalization is not possible. In such case, a general staff is sufficient.

It is desirable wherever practicable and possi-

ble to have at least the following departments of the medical staff: Medicine, surgery, obstetrics and gynecology, and eye, ear, nose and throat. Each of these clinical departments should have its own chief or head, responsible for all the work of the division. A more extensive amplification or differentiation might involve the full range of clinical specialties as, for instance: medicine, surgery, obstetrics, gynecology, pediatrics, urology, orthopedics, ophthalmology, otolaryngology, rhinology, neurology, psychiatry, pathology, radiology, anaesthesia, and other specialties and sub-specialties as deemed advisable. Well organized clinical departments will do much to promote the efficiency of the hospital.

There should be a satisfactory liaison between the governing body and the medical staff to insure harmonious co-operation. If this is not well established the administration and scientific success of the institution may be retarded. The governing body of the hospital and the medical staff must co-operate harmoniously in the best interests of the patient. This can be brought about more effectively through either of the following methods: (a) A committee from the medical staff to meet regularly with the governing body to discuss matters of mutual concern: (b) A joint conference committee composed of representatives from the governing body and the medical staff—the superintendent should also be a member of this joint committee.

It is most desirable that the medical staff organization include as many as possible of the progressive physicians and surgeons of the community, that it provide opportunities for the younger men to advance, and that it assume adequate control and supervision over the professional activities of the hospital. The efficiency of the staff organization may be said to be a good index as to the progressiveness of the institution as a whole.

By-Laws, Rules, and Regulations

The present day hospital is a complex organization where there are many individuals and groups of individuals with varying tasks requiring the most extensive co-ordination to assure proper care of the patient. To this end there must be a definite plan of organization of the hospital as a whole, with clearly stated constitution, by-laws, rules, and regulations showing organization, duties, relations, and responsibilities.

The medical staff should formulate and with the approval of the governing body adopt by-laws, rules, and regulations governing the professional policies and activities of the hospital. When approved by both bodies they should be signed by each member of the medical staff as an indication that he agrees to abide by the policies and procedures as set forth therein. Such by-laws should in a general way embrace the following: Qualifications for staff membership, application for staff membership, ethics and ethical relationships, term of appointment, procedure for appointment, divisions of the medical staff, departmentalization of the medical staff, officers and committees, meetings, quorum, agenda for meetings, rules and regulations pertaining to specific items in the functioning of the medical staff. Model sample by-laws for various sized hospitals are provided by the American College of Surgeons upon request.

Fee-Splitting

The governing body and medical staff of each approved hospital are required to declare themselves against the pernicious practice of fee-splitting under any guise whatsoever and must strictly carry out this policy in the hospital at all times. It is imperative that the governing body of the hospital and the medical staff adopt a resolution prohibiting fee-splitting and that all doctors privileged to work in the institution individually sign an anti-fee-splitting pledge, in duplicate, one copy to be filed in the hospital, the other sent to the American College of Surgeons to be incorporated in the report of the hospital.

When rumors of alleged fee-splitting are received by the College, immediate steps are taken to investigate them. If these rumors persist and there is good reason to believe that fee-splitting is carried on the institution may be dropped from the Approved List of hospitals or the rating suspended until the matter is satisfactorily cleared up. The College expects strict adherence to the principle of each physician issuing his own statement for services rendered, collecting his own accounts, and issuing his personal receipt for all moneys received.

Clinical Conferences

The medical staff should meet at least once a month to thoroughly review and analyze the clinical work of the hospital. There is an increasing tendency to make these meetings more frequent and in many hospitals they are held weekly.

Each doctor privileged to work in the hospital is expected to show his loyalty and interest in scientific medicine by availing himself of the opportunity of attending the staff conference. It should be obligatory that the regular or active staff attend at least 75 per cent of these confer-

ences and when absent should submit acceptable excuse. Members of the associate or courtesy staff should be invited to attend and be required to be present when their cases come up for discussion. Frequency of attendance at the clinical conference and degree of participation in the discussions should be one of the criteria in determining the fitness of a physician for re-appointment or promotion.

The periodic review and analysis of the clinical work should assure a three-fold purpose: (a) keeping the scientific work on the highest plane of efficiency, (b) providing the means through which members of the medical staff can continuously improve their scientific knowledge, (c) correlation and co-ordination of clinical data for the purpose of promoting group study and clinical research.

It is imperative that the entire discussion of the staff conference be devoted to the clinical work of the hospital. Medico-administrative matters and scientific papers not bearing on the work under review should be eliminated. Discussions must be frank, constructive, and free from unkind criticism, and should embrace a complete review and analysis of the clinical work, including certain deaths, unimproved, infections, complications, and all work not up to the standard of quality. Maximum benefit from the clinical conference will be obtained only when each member of the staff is encouraged to participate freely in the discussions. There should be a well directed and continuous effort to make the clinical conferences thorough and worthwhile and for this purpose good organization and energetic leadership, with a carefully prepared program, are essential.

It is required that each hospital compile an analytical summary of the clinical work each month in accordance with the analysis outline recommended by the American College of Surgeons. This report should be made available to each member of the medical staff either through display on the bulletin board or by distribution of individual copies. This gives at a glance the more essential information as to the general results of the medical work for the period under review.

It is required, as well as being most desireable, that each hospital hold its own staff conference. Experience has proven that it is difficult to secure a thorough review of the clinical work when hospitals combine to carry on these conferences. This frequently leads to inhibition of free and frank discussion, to say nothing of the limitation of time required to assure a thorough analysis of the work.

With the greater emphasis now placed upon the results of the clinical laboratory and the increased effort to secure autopsy material, a number of progressive hospitals have created what is known as the clinco-pathologic conference. This should in no way replace the staff conference, as its sole purpose is the study of pathology from the operation and from the autopsy with correlation of the clinical history. Too often such material is studied only by the hospital pathologist when in reality the physician and surgeon would probably benefit most from this study. It may be held monthly but some hospitals which find time for a weekly meeting, report a high attendance. After presentation of the case discussion is in order, and finally the clinical and pathological findings are correlated, summarized, and compared with reports in the literature. The educational features of such a program have proved so beneficial that all hospitals are urged to carry on clinico-pathologic conferences.

Clinical Records

It is required that clinical records be written on all patients and filed in an accessible manner. Each doctor should be held responsible for an accurate, complete clinical record on each patient treated in the hospital. Good records presupposes: (a) the individual and collective co-operation of all members of the medical staff, management, and personnel, (b) an efficient, well organized record department under competent supervision, (c) a definite plan for securing clinical records promptly, (d) adequate supervision through a registrar or committee of the medical staff, (e) a complete record, embracing all the component parts as outlined by the American College of Surgeons, and containing all the facts pertaining to the case.

It is imperative that clinical records be written promptly. To ensure this there must be a plan through which the current records can be inspected or checked up daily. An acceptable record should be complete and well balanced in data and have the signature of the attending doctor, thus signifying that to the best of his knowledge it is accurate and complete. A good clinical record, and the standard to be maintained in all approved hospitals, is one which embraces sufficient data to justify the diagnosis and warrant the treatment.

The advantages of a competent record librarian to assist the members of the medical staff in obtaining good records, in filing and indexing, and

compiling records is apparent and needs no argument.

Clinical records require careful and constant supervision in order to assure a high degree of quality. To this end triple supervision is advisable; (a) through the attending doctor, who should be responsible for seeing that a good history is promptly written, and, when completed and reviewed, affix his signature thereto; (b) through the record librarian or historian, who should see that all component parts of the record are properly assembled, filed, and indexed; (c) through an efficiency or record committee of the medical staff, who should review all the records at regular and frequent intervals for constructive criticism and appraisal. With these provisions records of better quality will be definitely assured. The clinical record of each patient should be written promptly after admission, and, without exception, within the first twenty-four or forty-eight hours. No patient, unless an emergency, should go to the operating room before the history is recorded and the preoperative diagnosis posted.

Clinical records should be filed in a readily accessible manner and cross-indexed according to one of the acceptable nomenclatures, and include indices for: (a) identification data, (b) diagnoses, (c) associated diseases or secondary conditions, (d) operation, and (e) causes of death. An adequate filing system adds greatly to the efficiency of the record department and makes scientific data readily available for reference and research purposes. There are a number of acceptable nomenclatures available, which could be readily adapted to the needs of any hospital. A more recent development has been the promulgation of a national nomenclature, the Standard Classified Nomenclature of Disease, which is receiving widespread support.

Clinical Laboratory

Every hospital should maintain a clinical laboratory with the necessary trained technical personnel to do at least the ordinarily required routine examinations of urine, blood, sputum, smears, spinal fluid cell count, etc. The more elaborate examinations, such as Wassermanns, Widals, pathology, can be performed outside the hospital in an approved laboratory. It is difficult in the present day for a doctor to practice medicine scientifically without ready access to the clinical laboratory for certain examinations necessary to aid him in making or confirming the diagnosis.

As a principle, the practice of accepting laboratory work done outside the hospital, when there is an efficient department in the institution, is not generally approved. In order to maintain efficient clinical laboratory facilities a hospital needs the entire support of the medical staff. Overhead charges for maintaining these facilities are, of course, obligatory and can only be absorbed without hardship to the patient by doing a reasonable volume of work. Each member of the medical staff should therefore support the hospital clinical laboratory by referring to it as much work as possible.

It is required that the clinical laboratory in an approved hospital have an adequate number of trained personnel. Technicians so employed should be graduates of approved training courses and registered with the American Society of Clinical Pathologists. This is an added assurance of their proficiency.

It is essential that the clinical laboratory be under medical supervision. This can best be accomplished by engaging the part or full time service, as required, of a trained, competent clinical pathologist. Should such an arrangement not be possible or practicable the services of a visiting pathologist might be secured, or arrangements be made with a member of the medical staff who has had special training and experience in pathology to supervise the work of the department.

There should be duplicate reports made of all laboratory work done in the hospital, one copy to be filed in the department and one with the patient's chart. This also applies to work done outside the hospital. It is essential that there be readily available reports of the amount and variety of work done in the department, monthly and annually.

All tissues removed at operation must be sent routinely to the clinical laboratory for examination and report. This makes possible a more accurate diagnosis and allows the surgeon to share with the pathologist a better knowledge of the clinical condition and the operation performed. Every piece of tissue, without exception, should be examined grossly or microscopically, and a complete description recorded. In addition, a microscopic examination and detailed report should be made for all specimens deemed advisable by the pathologist for the elucidation or confirmation of the diagnosis.

The system of clinical laboratory charges to be adopted is a matter of diversified opinion. The following methods, however, are in use: (a) schedule of charges for the various tests performed, varying according to the nature of the examination; (b) flat rate to cover cost of all work; (c) flat rate for routine work, with extra

charge for other examinations required; (d) inclusion of cost in room rate; (e) free service as through federal, state, county, or endowed laboratory; (f) joint arrangement with the clinical pathologist. The method adopted should not limit or embarrass the service to the patient. To this end, apparently, the flat rate is most frequently used in hospitals and includes at least the routine examination of urine, blood, sputum, smears, blood coagulation time, spinal fluid cell count, and examination of pathological tissues removed at operation.

X-Ray Department

Every hospital should have an x-ray department equipped to carry on radiography and fluoroscopy work. It is difficult to do accurate scientific work without this aid in making and confirming the diagnosis. If this service is secured from outside it should be reliable and there should be no delay or inconvenience to the patient. Whenever possible and practicable a mobile unit should be available for such cases as are not transportable.

The x-ray department should have permanent, trained technical personnel. Here also the registered technician is a further assurance of proficiency.

This department, like the clinical laboratory, should be under medical supervision, which can be best accomplished through engaging the part or full time services of a well trained, competent medical radiologist. If this is not possible or practicable the services of a consulting radiologist might be secured, or a member of the medical staff who has had training and experience in x-ray work appointed to supervise the department, and make interpretations.

Duplicate reports of all x-ray work done in the hospital should be made, one copy to be filed in the department and one with the patient's chart. It is also essential that there be readily available monthly and annual reports of the work done. When the x-ray service is secured from outside it should come from an acceptable radiologist and duplicate reports provided for filing as above stated.

Other Departments

Control of Surgery.

Serious consideration should be given by every hospital to the control of surgery in order to prevent unnecessary and incompetent work. It is advisable that each hospital institute some definite plan and procedure in this regard. The privilege of doing major surgery should be restricted and guardedly granted, as all doctors are not capable of doing major surgery. For the more successful and efficient performance of surgery the American College of Surgeons in its Hospital Standardization program lays down definite principles of procedure.

Care of Obstetrical Patients in General Hospitals.

Obstetrical patients must be segregated from all other types because of their susceptibility to infection. Likewise, patients admitted with or subsequently developing temperature or evidence of possible infection, should be isolated immediately, to protect other patients. In all cases of a major operative nature it is advisable to have consultation. Indications for operative procedures should always be recorded in detail. Every hospital caring for obstetrical patients should endeavor to adhere strictly to the above requirements, not only for the safety of the patient but to assure the best scientific care.

Treatment of Fractures.

The American College of Surgeons has laid down a minimum standard for the treatment of fractures. Approved hospitals are requested to co-operate with the College in improving the care of fractures through (a) providing a room or cabinet in which to keep the standard splints and equipment required, (b) appointing one member or a committee of the medical staff to have supervision over all fractures in the hospital, and (c) using the record blank recommended by the College for recording the history, examination, and results.

Physical Therapy.

Hospitals are directing more and more attention to physical therapy as an adjunct to treatment. Such a department is of distinct value if properly equipped, organized, and supervised. In all instances this department should come under the supervision and direction of a qualified medical physical therapist. In case such a person is not available there may be a member of the medical staff interested in physical therapy who would give sufficient time to direct and supervise the work.

Nursing.

Efficient nursing service must be the aim of every approved hospital. The success of the treatment of the patient depends largely upon the effectiveness of each unit of service rendered. This applies particularly to nursing, because of the special relationship it has at all times to the physical and scientific welfare of the patient. An adequate ratio of nurses to patients, with proper

supervision, must be maintained at all times in order to assure efficient bedside care.

Dietary Service.

A well organized dietary department with a competent, graduate dietitian in charge of the general and special dietary services is a great advantage to any hospital. Diet therapy plays an important role in the treatment of many diseases, and the dietitian can co-operate with the clinician and laboratory workers in the treatment of many types of cases. Every hospital should have a competent, graduate dietitian for the more efficient handling of the food problem and promulgating diet therapy.

Social Service.

Many hospitals find that the trained social worker is of distinct advantage to the social, physical, and scientific care of the patient. The social worker, co-operating with the physician, can be of valuable assistance in the diagnosis, treatment, and follow-up of the patient, the follow-up service being of particular value in ascertaining and improving end results.

Consultations

The consultation is an important factor in improving the professional efficiency of the institution and stimulating the more scientific practice of medicine. If properly conducted, it is of advantage to the four parties concerned: (a) the patient is assured of a more accurate diagnosis and better treatment, (b) the attending doctor is supported in the conduct of the case and responsibility shared, (c) the consulting doctor's general knowledge and experience is broadened, (d) the hospital is better protected from inefficient work as the consultation acts as a deterrent to wrong diagnoses and procedures. The choice of consultant should be carefully made and all findings recorded at the time the consultation is held.

Autopsies.

The autopsy affords a splendid means of checking up professional efficiency. It has been repeatedly stated by authorities that the number of autopsies performed in a hospital is one of the most valuable indices as to its scientific efficiency. In increasing the number of autopsies the fullest measure of interest and co-operation of the medical staff and hospital personnel is essential. Each approved hospital is expected to keep up the percentage of autopsies as recommended by the Council on Medical Education and Hospitals of the American Medical Association.

Control of Infections.

Every hospital should keep an accurate record of all infections and see that they are immediately investigated for the possible cause and reported to the staff conference for further consideration, if necessary. The control of infection pre-supposes periodic check-up on sterilizers, well supervised technique, and other general and special measures. It is desirable that all approved hospitals follow a definite method in frequently checking the efficiency of the sterilizing processes.

It is important that each hospital make adequate provision for the isolation, segregation, and observation of certain types of cases whose conditions might be inimical to the welfare of other patients in the hospital. This pre-supposes accommodations for the temporary care of communicable diseases developing in hospital wards and pending transfer. Facilities of this type are of value in minimizing infections that are likely to occur and spread rapidly throughout the wards of general hospitals. Provision should also be made for the segregation and observation of certain types of cases not suitable or desirable for contact with other patients. In many instances cases of doubtful diagnoses may be a potent danger to others in the institution. Adequate precautions can only be taken through the segregation of such cases.

Conclusion

Apart from the numerous scientific services which the patient expects in the hospital we must not overlook the factors of physical and mental comfort while undergoing medical care. Fortunately present day hospital construction has not only provided for greater convenience of services but comfortable furniture and attractive surroundings. The prevalence of sun parlors, roof gardens, and the many home and hotel features removes the institutional aspect and promotes a more rapid recovery and convalescence. In our scientific endeavors we must ever keep in mind that the humanitarian side of the hospital is also of vital importance.

Some Steps in the Progress of Medicine During 1933*

A. Stolinsky, M.D.
Sheldon, N. D.

Surgery

ONE of the most remarkable feats in surgery was the removal of an entire lung from a three-year-old child suffering from cancer of the lung; the operation performed by Dr. William F. Rienhoff, Jr., Johns Hopkins Hospital, is only the second such ever performed and the first attempted on a child; the child is now well and living normally.

First surgical removal of an entire lung was performed on an adult patient in April by Drs. Evarts A. Graham and J. J. Singer of Washington University Medical School, St. Louis.

Removal of the normal thyroid gland is a new method used by a group of Boston physicians and surgeons for relieving congestive heart failure and angina pectoris.

The severe pain of angina pectoris was relieved in six cases by cutting nerves, Dr. James C. White, Massachusetts General Hospital reported.

Removal of tumors of the pancreas and of as much as seven-eighths of that organ itself was done by Dr. Evarts A. Graham of St. Louis to relieve a newly-discovered disease just the opposite of diabetes and due to overproduction of insulin and featured by epileptic-like attacks, mental symptoms, excessive hunger and weakness.

For the first time an operation was performed on a patient who was being kept alive in a respirator or "artificial lung"; the operation was performed at the Long Island College Hospital, L. I., N. Y., and the patient survived.

Medicine

A leading subject of medical research during the year was the pituitary gland; evidence that it produces hormones affecting growth, sexual activity sugar utilization, milk production, and the thyroid and adrenal glands was presented and extraction of some of these hormones accomplished by investigators at McGill University, the University of California, University of Chicago, and the Rockefeller Institute for Medical Research.

The history of the functioning of an individual's pituitary gland throughout his life with all that tells of the individual's health and physical and mental development can be read in changes in his skull that may be seen in X-ray photographs, Dr. Hector Mortimer, of Boston, reported.

First known antidote for poisonous bichloride of mercury, formaldehydesulfoxylate, was discovered by Dr. S. M. Rosenthal, United States Public Health Service.

Progress in glandular treatment embraced successful treatment of seven cases of growth retardment verging on dwarfism by extract of growth-stimulating hormone of pituitary gland; relief from symptoms of premature old age in five women following removal of sex organs by treatment with theelin; and suggestion that Addison's disease may be treated more efficiently by the new adrenal-stimulating hormone of the pituitary gland instead of by giving adrenal cortex hormone.

Successful treatment of a bacterial disease (gonococcal vaginitis) by theelin, newly-crystallized female sex hormone was announced by Dr. Robert Lewis of New Haven, Conn.

Victims of Myasthenia gravis, a fatal disease characterized by general weakness, have been given new health and strength by two drugs, glycine and ephedrine, it was reported at the Mayo Clinic.

Dinitro-ortho-cresol and dinitrophenol were found to be powerful metabolic stimulants and weight-reducing medicines but several fatalities caused physicians to warn against careless use of dinitrophenol.

Convincing proof that many cases diagnosed as true epilepsy are actually cases of infestation with tapeworm larvae was presented to the Royal Society of Tropical Medicine, London, by Col. W. P. MacArthur, professor of tropical medicine at the Royal Army Medical College and consulting physician to the British Army.

Breakdown of the phosphocreatine mechanism of the body with resulting excessive excretion of creatine from the body is the basis for the muscular weakness of Graves' disease and of another condition, progressive muscular dystrophy, Drs. E. Shorr, H. B. Richardson and H. G. Wolff, of Cornell Medical School and New York Hospital reported.

Resistance to disease is a hereditary trait like color of eyes, hair or skin, studies with mice at

*Extracts from Science News Letters and Jour. A. M. A.

the Rockefeller Institute for Medical Research showed.

Research indicating that alcoholic cirrhosis may be due not to alcohol from beverages but to phosphorous from the iron and steel beverage containers was reported by Dr. Frank Mallory, of Boston.

The exact method by which blow-fly maggots act to clean and heal stubborn wounds was finally discovered by a group of Pittsburgh scientists who observed that the maggots throw out into the wound a secretion having weak digestive action which liquifies the dead and decaying matter.

Heat or cold or physical effort may cause headaches, asthma, skin eruptions and other symptoms of allergy in sensitive persons, Dr. W. W. Duke, of Kansas City reported. European physicians reported cases of cold allergy which suggest that people with idiosyncrasy to cold are in danger of drowning from bathing in cold water.

Amount of pepsin in stomach juice of patients suffering from stomach ulcer was found to be a good index of the progress and outcome of the disease by Drs. Arnold E. Osterberg and F. R. Vanzant, Mayo Clinic.

Cancer

A close chemical relation between a female sex hormone, oestrin and two of the most powerful known cancer-producing substances, two coal-tar compounds, was observed by Dr. J. W. Cook and Prof. E. C. Dodds, British scientists, who also produced in the laboratory a chemical compound having considerable oestrogenic action.

A reducing substance was discovered in cancer tissue by Dr. Leslie J. Harris, of the Cambridge, England, Nutritional Laboratory; significance of the discovery lying in the fact that increase of reducing action is one of the most important characteristics of cancer tissue.

Successful treatment of bone cancer by colloidal arsenic was reported by Drs. A. C. Hendrick and E. F. Burton, of Toronto.

The difference between cancer susceptibility and cancer insusceptibility involves one gene. Maud Slye, of the Sprague Memorial Institute and the University of Chicago, reported.

Liability to cancer as such is not inherited; length of life and susceptibility to certain irritants are the only hereditary factors that can influence the development of cancer, studies of Drs. M. R. Curtis, W. F. Dunning and F. D. Bullock, of Columbia University were reported to have shown.

Experiments supporting the view that cholesterol prepares the soil for the growth of cancer by acting as an accumulator of light were reported by Dr. A. H. Roffo, Buenos Aires.

Vitamines, Hormones

From the vital cortex of the adrenal glands Drs. Arthur Grollman and W. M. Firor, Johns Hopkins Medical School, extracted a crystalline substance so potent as to be considered probably the pure hormone.

Evidence that the adrenal cortex has an influence on regulation of salt and water in the body similar to that of insulin on sugar was found by Dr. R. L. Zwemer, Columbia University.

Maintaining the normal volume of circulating blood was declared by Drs. W. W. Swingle, J. J. Pfiffner, and H. M. Vars, P. A. Bott and W. M. Parkins of Princeton University to be the vital function of the adrenal cortex.

Research by Drs. Frank Hartman, J. E. Lockwood and K. A. Brownell, of the University of Buffalo showed that the adrenal glands appear to be concerned with vitamin utilization and milk production.

Nest-making, an "instinctive" activity of female rabbits, has been artificially provoked in them by injection of a commercial drug containing an active principle from the glands of pregnant women, Esther Bogen Tietz, of Cincinnati, reported.

Death from a diet deficient in vitamins, minerals or other vital food factors is not simply a case of starvation, as previously thought, but may be due to other factors, such as faulty use of fats, which is the cause of death in magnesium deprivation, Drs. E. V. McCollum, H. D. Kruse and Elsa Orent, Johns Hopkins School of Hygiene, found.

Crystals of apparently pure vitamin B, preventive of the Oriental disease beri-beri and other nerve disorders, were obtained by Drs. Atherton Seidell and M. I. Smith, United States National Institute of Health.

Scurvy-preventing Vitamin C was prepared synthetically by Dr. T. Reichstein and associates at the Polytechnic Institute of Zurich, who obtained pure crystals of l-ascorbic acid, considered to be identical with Vitamin C.

Connection between diet and cataract of eye was reported by several investigators: Prof. H. K. Muller, University of Basel, Switzerland, reported experiments showing that lack of Vitamin C might be a cause of cataract; Drs. Paul L. Day, William C. Langston and K. W. Cosgrove, Little Rock, Ark., and Dr. Arthur Yudkin, New Haven, reported studies showing that lack of Vitamin G may be a cause of cataract.

The
JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA, *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

North Dakota State Medical Association
South Dakota State Medical Association
The Hennepin County Medical Society
The Minnesota Academy of Medicine
The Soo Railway Surgical Association
The Sioux Valley Medical Association
North Dakota State Health Officers' Assn.
Great Northern Railway Surgeons' Assn.
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M. E. Herz, *Business Manager*
84 South Tenth Street, Minneapolis, Minnesota

W. L. Klein, 1851-1931

MINNEAPOLIS, MINN., MARCH 15, 1934

HOSPITAL PROBLEM

This thing we call the depression has greatly increased the burden and responsibility of the privately operated hospital, meaning all institutions for the care and treatment of the sick other than those supported by taxation. The cost of maintenance has not diminished, for retrenchment in a properly conducted hospital is only possible by reduction of service. Many hospitals, by prudent management, have been able to eliminate duplication and waste, with great resultant economy without sacrifice of quality and this has been a beneficial accomplishment. But the fact remains that in spite of every effort, the average private hospital is at the present moment operating at a loss and doing well to be able to continue in business.

The purpose of this special number of the JOURNAL LANCET is to present to its readers an authoritative summary of the details of this situation from the pens of those who are in a position to know whereof they write. Dr. J. M. Hayes, who undertook the selection of this material has used keen wisdom in the performance of his task and it is proper to state that he did so from a viewpoint of unusual advantage. In his official capacity as a member of the Legislative Committee of the State Medical Association and as chairman of the Economic Committee of the Hennepin County Medical Society, he has become very familiar with the harassing details of the economic side of all phases of medical professional work, and the present offering reflects to a marked degree the competent insight he has gained in his attention to these matters.

When members of our profession generally recognize the necessity for taking an active interest in its economic problems, in addition to essential scientific improvement, we shall have made a great advance in every direction. Especially is this true of hospital matters, when too often in the past all administration and policy details have been handled by exclusive lay boards. We need chosen co-operation to secure the best results, not only among ourselves but with members of the laity who show interest in our activities.

THE MAYO GIFT

There is something pleasingly convincing about the gift of an additional half million dollars to the Mayo Foundation from its original founders, Drs. William J. and Charles H. Mayo.

In the first place, the foundation was not the result of a single hasty impulse. Impulsive generosity does not repeat itself like that, nor does it deal in such large figures. It was the outcome of a well thought-out plan by which to advance scientific medicine. In the second place, this added sum is evidence that the plan has proven satisfactory to the donors. And finally, it's perpetuity is assured.

Some men cannot get away from their acquisi-

tive instinct as long as they live, with the secret ambition of having it used for some worthy project after their demise. How much better it is that the foundation be laid by the designers, and the structure be on its way while yet their counsel may be had in its actual construction.

A. E. H.

BOTHRICEPHALUS ON THE INCREASE

Bothricephalus latus, a cestode worm, formerly found only in certain districts bordering on the Baltic Sea, in parts of Switzerland, and in Japan has, like Columbus of old, also discovered America.

This largest and longest of all tapeworms, common in central and eastern Europe, is reported to have spread from the Baltic Sea counties particularly to the Great Lakes region where it infests the fish and endangers human beings who eat this food raw or inadequately cooked.

This is not altogether news, but because of our proximity to Lake Superior, it is well to remember its increasing prevalance. Specimens while not common, were met with in the Twin Cities more than 25 years ago. Pike is a fine fish and does not live long out of water, but even after that it may be the host to many little living potentialities of parasitic disease. Thus endeth another lesson of admonishment against poorly cooked foods.

A. E. H.

SNOW STORMS AND TEA

When Sven Hedin returned from his early Thibetan explorations, he was invited to address the Royal Geographical Society in London. After listening to a story replete with hardship and adventure, someone asked him what he most enjoyed while away from the comforts and conveniences of civilization for such a long time, and his answer was "snow storms and tea."

To many that statement made no appeal. Not so with the physician who has elected to practice medicine in this section of our glorious country. Oh yes, there are snow storms that seem to have attached a side-swiping velocity, needlessly extreme for the purposes of Darwin's "natural selection" or even the promotion of that decadent "rugged individualism" we hear so much about. But extremes are extremes and surely not the usual run in these parts. We have enjoyed a comparatively mild winter but it has been sufficient to keep our air-cooled human motors from boiling over at least. Is there anything more delightful than a nice snow storm when one is dressed for it and the circulating system is functioning normally? Work, and an invigorating climate in which to carry on, certainly contribute to health and happiness. It was not intended here to say anything about tea but a well brewed cup of good tea, like the Englishman's joke, "is not to be laughed at."

A. E. H.

CONDITIONED AIR ON RAILROAD TRAINS

The recent announcement that several of the railroads of the Northwest will, in the near future, use conditioned air in their dining cars and club cars came as a pleasant surprise to large numbers of persons who travel on these railroad lines. Railroad companies attempt to provide conditions which are essential to the comfort and health of their passengers. The common drinking cup has been discarded and replaced by individual drinking cups; water free from contamination is served. Milk and other foods were often the source of disease, so the railroad companies provide dairy products and meats which are properly inspected so that no harm could come to their passengers through foods. For example, they used pasteurized milk almost as soon as it was shown that pasteurization was a necessary health measure. Now many companies serve milk and butter only from herds of tuberculin-tested cattle.

Engineers, physicians, and others interested in health have been slow in recognizing the need for conditioned air. Of course, air conditioning has been used in a limited way since man first discovered fire. The human family has sought as their abodes, parts of the world where the atmospheric conditions were most comfortable, or have attempted to change them, principally by heating, in order to bring about comfort. They escaped from the cold of winter through inhabiting caves, building shelters, at first crude, but finally the modern house. To this they added fire; at first open, but now the modern heating plant. This has added to comfort but is far from perfect. From the heat of summer people tried to escape through seeking shady places, caves, and frequent plunges in cool water. These were only temporary, and do not add greatly to comfort.

There are still large numbers of diseases attributable primarily or secondarily to the air, such as the acute cold, sinusitis, in fact, nearly all of the acute respiratory infections, including pneumonia.

Another large group of people suffer from conditions due to contamination of the air, such as hay fever and asthma. As these health hazards became recognized, there was an attempt to learn as much as possible about ideal atmospheric conditions, with the thought of producing them in homes and buildings where people live and work. Careful investigation of the Chicago Ventilation Commission about 1914 and the New York Ventilation Commission about 1923, showed that the human body functions best, both in health and disease, when the temperature of the air is approximately 68 degrees, the relative humidity 40-50 per cent, the air free from contamination, and in slow circulation. If these factors, which differentiate between good and bad air could be produced and maintained throughout the year in homes and other buildings occupied by human beings, not only would much comfort be added, but much misery from illnesses would be prevented. Therefore, attempts were made to condition air with all of these factors included. The development has been remarkably rapid. Already houses, school buildings, office buildings, etc., have been equipped with air conditioners, which provide these factors. At first the expense of producing and installing air conditioning devices made them almost prohibitive, but already the prices have come very nearly within range of the average home owner.

Conditioning the air of a pullman car presents a number of difficulties which increase the expense of producing and maintaining such air. When the Baltimore and Ohio Railroad first introduced conditioned air, it was only in the dining and club cars. This road, along with others in the East, now have whole trains with conditioned air in each car. This we may hope for on the lines of the Northwest.

For some time the JOURNAL-LANCET and its staff members have been calling attention to the well-established facts concerning the value of conditioned air.[1] [2] It looks upon the step taken by railroads of the Northwest as one which will not only provide comfort and better health facilities for passengers, but will also have a great educational influence, which will be reflected in equipping hospitals, houses, school buildings, factories, etc., with air conditioning systems.

J. A. M.

1. Myers, J. A.: Fresh Air Faddism, The Aerologist, October, 1930.

2. Myers, J. A.: The Role of Air in Education, Past and Future, The Aerologist, September, 1931.

NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. S. U. Ivers, has recently opened offices for general practice at Fargo.

A new hospital has been opened this month at Canton, S. D., with Miss Lucille Oliver, R. N. as superintendent.

More than 600 patients are treated daily at the Minneapolis General Hospital, keeping it filled to its full capacity each day.

Dr. L. O. Flanagan, has become associated with the Austin, Minn., Clinic, as a specialties in diseases of the eye, ear and thorat.

Dr. J. O. F. Kraushaar, Aberdeen, S. D., was recently presented the "Cosmopolitan Medal" for meritorious civic service in that city during the past year.

Vermillion, S. D., will have a new hospital this year, providing the government grants that city a loan of $25,000 to assist in the erection of the same.

Dr. Charles Nelson, Fergus Falls, and Dr. F. A. Amundson, Duluth, have been appointed members of the Minnesota State Board of Medical examiners.

Dr. T. E. McDermott, who has been in active practice for over 25 years in Minneapolis, died at his home in that city, after a short illness at the age of 77 years.

The tentative program of the South Dakota Medical Association will be issued on April 1, as the annual meeting will be held at Mitchell, on May 14, 15 and 16.

The Mower County Medical Society held their monthly meeting at Austin, Minn., with Dr. E. C. Rebman, Austin, the principle speaker, his subject being, "Medica, Truths."

Dr. Frank C. Titzell, formerly located at Iowa City, Iowa, has returned to Beach, N. D., where he will continue his practice of general surgery and consultation work exclusively.

Dr. F. J. Savage, president of the Minnesota State Medical Association, was the guest speaker

at the last meeting of the members of the Camp Release Medical Society held at Granite Falls, Minn.

Dr. Eben J. Carey, Milwaukee, dean of the Marquette University school, was the principal speaker at the fourteenth annual founders day dinner of Phi Chi Medical Fraternity at Minneapolis last month.

The South Dakota supreme court has reversed the damage suit brought against Dr. Guy E. VanDemark, Sioux Falls for $50,000. It was a complete victory for the doctor and the profession of that city.

At the annual meeting of the secretaries of nine Northwestern State Medical Associations, held at St. Paul last month, Dr. P. J. Kreuscher, Chicago, was elected president, and Dr. R. L. Parker, Des Moines, secretary.

A newly formed group of the younger members of the Ramsey County Medical Society, has been organized at St. Paul with Dr. J. A. Moga, president; Dr. E. E. Scott, vice-president, and Dr. H. F. Flanagan, secretary.

Dr. Charles G. Weston, a former prominent Minneapolis physician, died at Miami, Fla., on March 2, at the age of 75 years. Dr. Weston was one of the founders of the Hillcrest and General Hospitals of Minneapolis.

The hospital at Parkston, S. D., which has been closed for some time, has been sold to the Sacred Heart Convent, of Yankton, who will make extensive improvements and hope to have it complete for opening in the early spring.

The North Dakota Hospital Association was recently organized at Bismarck, with the following officers: J. T. Tollefson, Fargo, president, and H. L. Halvorson, Minot, secretary. Sixteen hospitals were made charter members.

The next meeting of the Todd County Medical Society will be held at Browerville, Minn., on April 5. Secretary Gifford extends an invitation to all physicians and their wives to be present, as a very attractive program will be presented.

The Madison District Medical Society held their quarterly meeting at Brookings, S. D., with a large attendance of members, and after a hearty dinner being served, a round table discussion followed, the topic being "Amoeblic Disentery."

The Grand Forks Medical Society have new officers for 1934 as follows: Dr. M. B. Ruud, Grand Forks, president; Dr. J. L. Mulder, Cavalier, vice-president; Dr. L. T. Lohrbauer, Grand Forks, secretary, and Dr. J. P. Miller, Grand Forks, treasurer.

Dr. Leslie G. Hill, Estherville, Iowa, died last month after a prolonged illness. Dr. Hill was formerly in practice at Sioux Falls, and was well known and popular in all sections of the state, having served as president of the state board of medical examiners for several years.

Dr. Samuel Alan Challman has been appointed director of the Minneapolis Child Guidance Clinic, succeeding Dr. Herbert E. Chamberlain, who resigned last year to direct a similar clinic established at the University of Chicago. Dr. Challman is a graduate of the University of Minnesota School of Medicine.

The program presented at the Minnesota Academy of Medicine at their March meeting was one that brought out a large attendance of members. Thesis, "Some Comments on Mortality and Morbidity Trends," Dr. Henry W. Cook; "Operative Division of the Horseshoe Kidney," Dr. Frederic E. Foley. Case Report, "An Unusual Form of Renal Polycystic Disease," Dr. William F. Braasch.

Mrs. Christine Nelson, Minneapolis, entered a plea of guilty to an indictment charging her with practicing medicine without a license, before the District Court, in Minnneapolis. The court sentenced the defendant to pay a fine of $250.00 or six months in the Minneapolis Workhouse. The sentence was stayed for one year upon the condition that the defendant absolutely refrain from the practice of medicine. Mrs. Nelson, over a period of two years and a half, had been treating a middle aged Minneapolis woman for cancer of the breast. During this time she had been paid the sum of $310.00. The treatment consisted of the application of a salve or paste followed by the application of a flaxseed poultice causing a sloughing of the involved area. The patient's condition became worse and it was necessary to call in a physician and surgeon who operated upon the patient and removed the breast in November 1933. If there is any further violation of the law by the defendant the State Board of Medical Examiners will request that more drastic action be taken against her.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS, FEBRUARY 10, 1934

BY EXAMINATION

(January)

Name	School	Address
Andrus, Frank Clinton	U. of Minn., M.B., 1932, M.D., 1933	Minneapolis General Hospital, Minneapolis, Minn.
Boehme, Earl J.	U. of Minn., M.B., 1932, M.D., 1933	455 Herschel Ave., St. Paul, Minn.
Bossingham, Earl Nathaniel	U. of Minn., M.B., 1933	St. Mary's Hospital, Duluth, Minn.
Carow, Theodore Moffett	U. of Ill., M.D., 1932	Mayo Clinic, Rochester, Minn.
Dodds, George Alfred	U. of Ore., M.D., 1932	Glen Lake Sanatorium, Oak Terrace, Minn.
Engdahl, Frederick William	U. of Minn., M.B., 1933	St. Mary's Hospital, Duluth, Minn.
Ericsson, Martin Gust	U. of Minn., M.B., 1933	St. Mary's Hospital, Minneapolis, Minn.
Flom, Martin Gerhard	Indiana U., M.D., 1933	Fairview Hospital, Minneapolis, Minn.
Guthrie, John Somerville	Queen's U., M.D., 1927	Mayo Clinic, Rochester, Minn.
Hayden, Ralph O.	U. of Minn., M.B., 1933	Minneapolis General Hospital, Minneapolis, Minn.
Hodgson, Corrin Haley	U. of Minn., M.B., 1931, M.D., 1932	Fergus Falls, Minn.
Kennedy, George Lawrence	McGill U., M.D., 1932	713 Donaldson Bldg., Minneapolis, Minn. Minn.
Knoepp, Louis Frederick	U. of Mich., M.D., 1931	Mayo Clinic, Rochester, Minn.
Kulzer, Norbert John	U. of Minn., M.B., 1933	St. Mary's Hospital, Minneapolis, Minn.
Montgomery, Lall Greenway	U. of Manitoba, M.D., 1929	Mayo Clinic, Rochester, Minn.
Olmanson, Edmund Goodwin	Northwestern U., M.B., 1933	St. Peter, Minn.
Plunkett, John Elmer	Queen's U., M.D., 1930	Mayo Clinic, Rochester, Minn.
Pugmire, Adrian Smuin	Northwestern U., M.B., 1933	941 S. 11th St. E., Salt Lake City, Utah.
Schwinghamer, Elmer James	Washington U., M.D., 1932	Benson, Minn.
Silver, John David	U. of Minn., M.B., 1932, M.D., 1933	1201 9th St. S., Minneapolis, Minn.
Sloan, Julius	U. of Minn., M.B., 1933	1715 8th Ave. N., Minneapolis, Minn.
Smith, Thorsten	U. of Minn., M.B., 1933	Ancker Hospital, St. Paul, Minn.
Stein, Kenneth Edward	U. of Minn., M.B., 1932, M.D., 1933	St. Mary's Hospital, Duluth, Minn.
Strohl, Everett Lee	U. of Ill., M.D., 1932	Mayo Clinic, Rochester, Minn.
White, Asher Abbott	U. of Minn., M.B., 1929, M.D., 1930	424 Walnut St. S. E., Minneapolis, Minn.
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BY RECIPROCITY

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Moran, Tressa Rose	Loyola U., M.D., 1921	St. Luke's Hospital, St. Paul, Minn.
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Minneapolis, Minnesota
April 1, 1934

New Series
Vol. LIV, No. 7

Remarks on the Tubercle Bacillus: Diagnosis, Prognosis, and Epidemiology*

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Philadelphia, Pa.

WHEN Kock announced the discovery of the tubercle bacillus in March, 1882, he provided the key to the entire tuberculosis problem. Not only had he furnished the evidence as to the cause of the disease, but he had given the means whereby it might be controlled. Other specific causes of disease had been discovered previously, but none of them had attracted the immediate and widespread interest that the tubercle bacillus aroused. Although there was a feeble flutter of protest and skepticism over accepting Koch's discovery, I was quickly subdued and by the end of two years the tubercle bacillus was universally accepted as the cause of tuberculosis. Prior to the discovery of the bacillus the idea that tuberculosis was hereditary had become so thoroughly ingrained in medical thought that many were unable to accept the opinion that the disease was infectious. They took the paradoxical view that while the tubercle bacillus might be constantly associated with the disease, it was not transmissible from one person to another and that when the disease occurred in several members of a family, it was not an evidence of infection but of an hereditary susceptibility or diathesis. This phase of the question was not settled quickly. Over ten years were to elapse before the medical profession, as a whole, was to abandon the hereditary theory. And among the laity one still hears echoes of this belief.

Koch, in his second paper, published in 1884, dealt more particularly with the infectiousness of the disease. In this paper he emphasized the fact that it would probably take several generations for the medical profession to grasp the full significance of the tubercle bacillus and particularly the part it would play in the prevention of the disease.

Of all the laboratory tests available, that of the examination of the sputum for the presence of tubercle bacilli is one of the simplest. It is almost as easily carried out as the taking of the temperature or the giving of a hypodermic injection. In spite of this, however, it is remarkable how often it is neglected. Lack of time is no adequate excuse for the reason that in nearly every community, municipal or state laboratories are available. This neglect is reflected in surveys of tuberculous patients made in order to determine what means had been taken to establish the diagnosis. In far too many of these patients, the sputum either was never examined or only after the disease had been well established. The importance of sputum examinations is shown by Pinner, who reported that in a group of 507 patients with clinically active tuberculosis tubercle bacilli were demonstrated in 502, or a fraction more than 99 per cent. It cannot be too strongly emphasized that a cough that has persisted for six weeks or longer calls for an examination of

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the sputum. And the longer the cough has existed, the greater the need. It would be well if the profession took sputum examinations as seriously as they do the X-ray, the Wasserman test, the various other laboratory aids.

Diagnosis

It is now known to a certainty that the one indubitable evidence of pulmonary tuberculosis is the presence of tubercle bacilli in the sputum. One may be in a quandary as to the significance of certain symptoms or the interpretations of an X-ray shadow, but the presence of tubercle bacilli in the sputum removes all doubt.

Easy as this procedure is, there are certain fundamental facts that must be observed. *First,* there must be the assurance that the specimen of sputum obtained comes from the lower respiratory tract. Only too often the laboratory slip reads "specimen unsatisfactory." Such specimens usually consist either of saliva or of material hawked up from the nasopharynx. The patient must be told how to bring up the bronchial secretion. This will save much wasted effort.

In the *second* place, the technique of selecting the proper material from the sputum itself is often faulty. Plunging the platinum needle blindly into a bottle or box and smearing the slide with the mucus that adheres, is a hit or miss method that more often fails than succeeds. The small yellow particles scattered through the sputum are the portions most likely to reveal bacilli, if any are present.

Thirdly, there is a misapprehension as to the significance of negative sputum examinations—one or two negative examinations are meaningless. They do not rule out the possibility of tuberculosis. The rule adopted at the Phipps Institute is that there must be ten successive negative examinations, and in case there is still a suspicion that open tuberculosis may be present, a guinea pig inoculation is made.

It is not to be understood that tuberculosis cannot be present without showing tubercle bacilli in the sputum. Tubercle bacilli will not be found in the latent symptomless case nor in the minimal (incipient) closed case with definite symptoms. In the latter group sputum examinations should be made at frequent intervals and in the presence of an acute respiratory infection, for the reason that a closed case may at any moment become an open one.

Repeated examinations are essential also in very chronic, slowly progressive cases where tubercle bacilli are few in number and intermittently present. They may show a number of series of negative examinations and then a positive series will appear. For example, there were made in the case of Mr. X fifty-three sputum examinations between September 1, 1932, and February 15, 1934. Of these, forty-nine were negative. The last positive finding was on October 25, 1933. Instances of this kind belong to that group of open cases that readily escape notice and may be the unsuspected source of infection to their associates. This type of case should be instructed to bring the sputum for examination whenever an acute respiratory infection occurs.

Fourthly, it should never be taken for granted that by reason of a certain chain of symptoms and abnormal physical findings that tuberculosis is present and it is a wate of time to examine the sputum. Every sanatorium physician is familiar with the fact that many patients are sent to a sanatorium with a diagnosis of tuberculosis and without a sputum examination, when in reality some other condition is present—bronchiectasis, pneumoconiosis, chronic basal infiltration, chronic abscess, foreign body, malignant disease, mycotic disease. All of these conditions may be mistaken for tuberculosis. In some instances the resemblance is very close. In the face of evident pulmonary damage with respiratory symptoms repeated negative examinations will exclude tuberculosis as the cause in the vast majority of cases.

Fifthly. While one positive examination may be regarded as proof that pulmonary tuberculosis exists, experience has shown that a single positive finding is not always infallible evidence. This is now so well recognized that a confirmation of the first finding should be verified. Errors, often difficult to explain, do occur in which an original positive finding cannot be verified. It may be that the slides become mixed, or the report slips are confused, or an old slide has not been cleaned thoroughly. An inexperienced observer may mistake some extraneous red particles for tubercle bacilli. Instances are on record also of a streptothrix organism highly resistant to the decolorizing agent being mistaken for tubercle bacilli.

While these errors are not common, they are to be kept in mind for, when present, they are most confusing. In my own experience, I have encountered a number of them. Three examples encountered within the past few months will suffice to illustrate the confusion that ensues:

Case I. A young married woman was referred to me with a history of losing weight and extreme malaise. These symptoms dated from a

pregnancy two years previously. She had no respiratory symptoms other than a little expectoration in the morning. She had had three sputum examinations, two negative and one positive. Owing to negative physical findings and the vague clinical evidence, I became mistrustful of the single positive finding. This was strengthened by a normal X-ray finding. Her sputum was examined a number of times and also injected into a guinea pig. These were all negative.

Case II. A Negro attending the Phipps Institute Dispensary complained of cough and expectoration. He had numerous rales in his chest. A single sputum examination was reported positive and the X-ray report indicated a probable tuberculous lesion at the right apex. A second suptum examination was not obtained as the man failed to return. Some months later he died in a hospital and the thoracic organs were sent to Dr. Esmond R. Long. There was a syphilitic aortitis and scattered small patches of fibrosis scattered throughout both lungs. In spite of the positive sputum and X-ray findings, there was no evidence of pulmonary tuberculosis. In view of the aortitis, syphilis of the lung was suggested as a cause of the pulmonary fibrosis.

Case III. This case is unique in my experience, but it serves to emphasize the need of verifying a positive finding at once. I was asked to see a young boy attending a preparatory school. He was taken ill with an abrupt rise in temperature, cough and expectoration. Owing to the presence of rales over the left upper lobe and a suspicious shadow in the X-ray film, the school physician examined his sputum, which was found to be positive. Unfortunately, this was not repeated. The family was unwilling to accept the diagnosis and the slide was submitted to an accredited pathologist who reported it as being negative. I saw the boy six weeks later. At that time the rales persisted, but the fever, cough and expectoration had disappeared. What was the diagnosis? No more sputum was available. The weight of opinion leaned towards the negative finding. My decision was that the boy should be regarded as being tuberculous unless it could be proven otherwise. Later I learned that the original slide was submitted to another pathologist who reported the presence of tubercle bacilli. And now curiously enough the attending physician chose to adhere to the one negative report.

I might add a number more of such experiences; but these I think, will illustrate the fact that a single positive report cannot always be accepted at its face value.

Fraudulent Use of the Sputum. This forms one of the curious chapters relating to pulmonary tuberculosis. My attention was first directed to this possibility many years ago. During the first few years of the Phipps Institute two quarts of milk were given daily to dispensary patients as a preventive measure, where there was evidence of a lack of sufficient food. It was not long before some people learned that if their sputum was positive, such aid was forthcoming. If they had no sputum or it had been found negative, bringing a friend's sputum known to be positive answered the purpose. This, of course, was in the pre X-ray period.

Following the war, this expedient was often resorted to. This led to a ruling by the Veteran's Bureau that the applicant must expectorate in the presence of the doctor in order that there could be no mistake as to the origin of the sputum.

I had an experience with one such case at the White Haven Sanatorium. Another example of the fraudulent use of sputum that has come to my notice is that of a group of healthy men who applied to a tuberculosis dispensary stating that they had tuberculosis. Each one brought a specimen of sputum and all the specimens showed many bacilli. It developed that they had been told that if they could establish the fact of having tuberculosis, it would strengthen their claims for relief.

Numbers of bacilli per microscopic field. While a report that indicates the presence of tubercle bacilli is sufficient to establish a diagnosis, it can be made more effective by indicating the number of bacilli per field. The Gaffky scale, while admittedly furnishing only a rough estimate, does serve the purpose of distinguishing between specimens showing very few organisms (Gaffky I or II) and one showing a moderate or large number of bacilli (Gaffky VIII, IX, X). Hughes has recently reported a more accurate method of determining the total number of bacilli in a given amount of sputum.

Chronic long-standing cases, even with a large cavity, may show no bacilli or a few only at intervals. On the other hand small newly formed cavities no larger than a pea may throw off myriads of organisms. Long, by means of sections made through the walls of long-standing cavities, has shown that there may be but few organisms, while in the recently formed ones, the bacilli occur in large numbers.

At the present time I have under observation

a man with a cavity the size of an orange in whom repeated examinations of the sputum have failed to show tubercle bacilli. The absence of bacilli in the sputum of such cases may be explainable in one of two ways: First, the interior of the cavity may become smooth and glistening with no evidence of ulceration; and, secondly, the bronchus draining the cavity may become kinked as the result of contraction of fibrous tissue, thus closing off the cavity.

As will be shown later, the number of bacilli is of valuable prognostic and epidemiological significance.

Can tubercle bacilli be present in the sputum without a demonstrable lesion? Several years ago the sputum of a patient in the White Haven Sanatorium was repeatedly positive. There were no abnormal physical signs and the X-ray film was apparently normal. Within the past year a pupil nurse from one of the large hospitals in Philadelphia developed symptoms of pulmonary tuberculosis and her sputum was repeatedly found to be positive. Physical signs were absent, and the X-ray film was reported negative. She was admitted to the White Haven Sanatorium and a second X-ray film on careful examination revealed a faintly outlined cavity near the left hilum. This cavity was brought out more sharply by slight rotation. With improvement in X-ray technique and by reason of greater experience in interpreting films, it is now recognized that cavities near the hilum are not rarities. They are often indistinct and can be readily overlooked, especially if one follows too strictly the rule that absence of trouble in the apices frees the patient of the suspicion of having a lesion. I believe that it may be assumed that the persistence of bacilli in the sputum means a tuberculosis lesion in the lung and that a painstaking examination, particularly of the X-ray film, will show such a lesion to be present.

Prognostic Value of the Tubercle Bacillus

There is no phase of tuberculosis that is fraught with so much uncertainty as the determination of what is to be the outcome in a given case. Some of this uncertainty has been removed by the use of serial X-ray films whereby one gets a more accurate picture of the advance or retrogression of the disease. The sedimentation test and white cell count are still on trial and are not to be relied upon of themselves.

In minimal lesions that are closed, and providing the proper treatment is instituted, the prognostic difficulties are not so great. Most of them may be regarded favorably. It is the open case with tubercle bacilli in the sputum that gives rise to uncertainty.

The idea long prevailed, and still does, for that matter, that a patient who had regained his weight and no longer had constitutional symptoms might be discharged as having his disease arrested even though there might still persist a slight cough associated with some sputum containing tubercle bacilli. The whole trend of modern treatment is against this view. Nowadays every effort is being directed towards rendering the patient free from sputum. This means, in the vast majority of cases, the obliteration of a cavity. Hence the increasing use of artificial pneumothorax, pneumolysis, phrenectomy and thoracoplasty. I am not denying the fact that there are individuals that remain apparently well for indefinite periods of time in spite of the fact that their sputum remains positive. But the number of such cases is not great and even they are under the constant threat of the disease extending. The cause of relapse in patients in whom the disease has apparently been arrested is to be ascribed in the vast majority of cases to the fact that their cavities have never been obliterated. Therefore, soon or late, there is a broncho-genic extension of the disease or metastasis to other organs.

In an open case of tuberculosis, the only assurance one has that the patient is cured is the disappearance of tubercle bacilli from the sputum. Until this is accomplished, the possibility of a relapse is ever present. How long must the sputum remain negative? This cannot be stated with a definite certainty. A fair working rule is that if the sputum remains negative after four series of examinations (five each) and a final guinea pig test is negative, the patient may be regarded as cured. There is, however, one proviso; namely, that there is no evidence of cavitation. So long as a cavity remains open, there is always a possibility of tubercle bacilli reappearing in the sputum even after long intervals.

The Disappearance of Bacilli From the Sputum Under the ordinary rest treatment and without other aids this may occur in several ways. In the first place the number of bacilli, as indicated by the Gaffky scale, may gradually diminish. In the second place, without any change in the Gaffky scale, bacilli may abruptly disappear. In my experience the latter is the more common way.

The use of artificial pneumothorax, pneumolysis, or other accessory aids, often causes an abrupt disappearance of bacilli by closure of a

cavity. And it is this fact, more than anything else, that has led to the rapidly increasing use of these methods.

Epidemiology

As has already been pointed out, Koch's prophecy that it probably would take several generations before the significance of the tubercle bacillus in the matter of prevention would be realized has been amply borne out. Indeed, it is only within the past decade that a concerted effort has been made to fathom the mysteries of the transmission of the disease. The use of the tuberculin test to determine the extent of infection in a community and X-ray examinations to demonstrate the small primary node, tracheo bronchial lesions in children and the latent pulmonary lesions of adolescence (all of which were previously beyond our reach) show the insidious beginnings of the disease. And all of this represents the transference of the tubercle bacillus from a single open case to those in immediate contact.

Considered, therefore, from the viewpoint of prevention, the detection of tubercle bacilli in the sputum of open cases is the most important single agent we have at our command. So true is this that no matter what other methods are applied. if the open cases are not ferreted out and isolated or properly instructed how to protect those about them, the disease will continue to spread. With this in mind it is essential to keep before us two facts: First, the necessity of examining those in immediate contact with the open case in order that the extent of the spread of the infection may be determined; and, second, to trace the source of the infection in the open case. In family infections the spread of the disease from one member of the family to others in the household is not difficult. In the case with no obvious source of infection the problem is more difficult. It is only by the most meticulous taking of histories and the investigation of every posible clue that the source of the infection in these cases can be revealed.

The determination of the number of bacilli thrown out is of value epidemiologically. Dosage is now admitted to be an important factor. The dose may be relatively small but long continued or it may be very large and the exposure brief. In chronic long-standing cases the number of bacilli expelled is often small and may occur intermittently. The chief danger in these cases is that they so often are not recognized. And while they infect others slowly they are none the less the source of infection in many instances. It is for this reason that individuals with chronic cough and expectoration should have their sputum examined at fairly frequent intervals. On the other hand the number of bacilli expelled may be enormous. This is particularly true in Negroes. In the acute fulminant type of case in Negroes each microscopic field may show thousands of bacilli. Hughes, in a study of the bacillary content of the sputum, showed that the sputum of the Negro, as compared to the White, contained, on the average, three times as many bacilli. This is probably one of the factors causing the high incidence of the disease and the equally high mortality rate in the colored race.

In the average case of chronic ulcerative type of pulmonary tuberculosis in the white race the number of bacilli, as reckoned by the Gaffky scale, is rarely very low nor excessively high. As a rule the disease is slow in manifesting itself clinically. In infants flagrantly exposed, an overwhelming infection may take place and death occur in two or three months. In older children the infection progresses relatively, slowly becoming recognizable only after four or five years. Latent apical lesions in adolescents may take twice as long.

In adults, as shown by marital infection, the disease may not become evident clinically before seven or eight years have elapsed. The older the individual, the longer the time it takes to cause infection, although in young people evidences of infection may occur as early as two or three years after exposure (Opie and Mcphedran). It is this long period of quiescence that renders it possible by the examination of contacts to institute treatment early and thus forestall the development of clinical tuberculosis.

In the matter of prevention, another interesting outlook is presented. Hitherto all of our therapeutic efforts have been directed towards the relief of the individual. The use of artificial pneumothorax, pneumolysis, etc., have been advised for the benefit that may accrue to the patient himself. Taking a broader view of the subject, it is now apparent that the sterilization of the patient by closing cavities not only prevents metastasis in the patient himself, but prevents the expulsion of bacilli in the sputum. The latter consideration is of the utmost importance as it makes the individual harmless to his associates.

THE ROLE OF THE GENERAL PRACTITIONER IN THE CONTROL OF TUBERCULOSIS*

P. P. McCAIN, M.D.
SANATORIUM, N. C.

THE newer knowledge of tuberculosis has helped greatly to clarify our understanding of the factors which are most necessary for the control of the disease. Nothing is more evident than the necessity of having the full co-operation of the rank and file of the medical profession before any large measure of control can be obtained.

The progressive family physician who will apply modern methods of prevention and control in the families which he serves, and who will use the tremendous influence which he has in educating the public to an appreciation of the value of such methods, will not only render a most useful service to the community, but will also increase both his own prestige and income. The fight cannot be won by tuberculosis specialists, radiologists, public health officials and social service workers. These all render valuable services, but in the final analysis any successful program will depend largely on the active co-operation of the family doctor.

In a considerable proportion of our country there are no regular tuberculosis clinics nor any visiting tuberculosis nurses and few organized agencies of any kind to wage any systematic fight against tuberculosis. In such communities hope for such control rests almost entirely with the family physician. In communities in which there are the best organized clinics and control agencies the family physician can do much toward defeating the whole program by an attitude of indifference or opposition. Such an attitude on the part of any physician will eventually, of course, prove a boomerang to him, because the public is gradually learning that prevention is better and cheaper than prolonged treatment, and that the physician who doesn't know how and when to look for danger signals cannot be trusted.

Heretofore efforts for the control of tuberculosis have been directed largely toward treating and isolating those who were sick enough to consult a doctor. We now know that this is like locking the stable after the horse has already been stolen. Eighty per cent or more of such patients have already passed the curable stage and most of them have already passed on their infections to those with whom they live and work.

Recent knowledge emphasizes the necessity of extending our studies to those who are apparently well and especially to that group of apparently well individuals who have been exposed to known cases of tuberculosis. Through the use of modern methods it is possible not only to discover the disease in its earliest demonstrable and curable forms, but also to discover those who have tuberculous infection. By the discovery of those who have infection and early disease and by insisting on those with more advanced disease taking rigid precautions against further infecting others there is real hope of reducing tuberculosis to one of the minor causes of death.

Before any physician can intelligently handle his tuberculosis patients it is necessary for him to have a clear understanding of the various phases of the disease and of the problems involved with each. A most helpful little pamphlet "Diagnostic Standards" which explains the classification of tuberculosis in detail should be in the hands of every practicing physician and can be obtained from the National Tuberculosis Association for only a few cents. The following is a brief summary of the various stages:

1. *Tuberculous Infection.* This can only be recognized by a positive tuberculin test, which most authorities now feel indicates the presence somewhere in the body of live tubercle bacilli. There are no symptoms or abnormal physical signs. No other pathology save the positive tuberculin test can be demonstrated. The individual is thought of as having infection, but as yet no definite tuberculous disease. If all infected individuals



FIGURE 1

V. F. X-ray negative. Tuberculin test positive. No other evidence of tuberculosis. If proper steps are taken this child should never develop actual disease. (Father has tuberculosis with positive sputum.)

*Prepared especially for THE JOURNAL-LANCET.

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could be discovered in this stage, if they would have their other defects corrected, if they would obey the laws of health and if they would avoid exposure to further massive infection, practically none of them would develop definite tuberculosis. Infected individuals of this class who are in the greatest danger are those who live in contact with an open case of tuberculosis. For their protection the open case of tuberculosis should, if possible, be sent to a sanatorium. If this cannot be done, he should be taught to practice rigid precautions against further infecting others.

2. *Childhood or First Infection Type of Tuberculosis.* This represents the earliest demonstrable stage of the disease. It can rarely be diagnosed except by the X-ray and by a positive tuberculin test. It is practically never accompanied by symptoms and abnormal physical signs. X ray films usually show a small primary focus somewhere near the periphery of the lung and an involvement of the tracheobronchial glands into which the lymph from the area of this focus drains. If all cases of tuberculosis could be discovered in this stage, if further infection from outside sources could be avoided and if reasonable health rules could be followed, practically all cases could be cured at home under the care of their family physician with little expense and without the loss of time from school or work and before they became a source of danger to others.



FIGURE 2

(Retouched.) S. F. (sister of the above). Childhood or first infection type tuberculosis. P. F., primary focus; T. B. Tr. Br. gl., tuberculous tracheobronchial glands. Tuberculin test positive. Symptoms and physical signs almost never present. Patients in this stage all curable with proper treatment and not a source of danger to others.

3. *Incipient or Minimal Tuberculosis.* This stage represents the earliest form of the adult or re-infection type of the disease. In most cases there are no symptoms and either very indefinite physical signs or none at all. Usually there is no cough or expectoration and when sputum is present it is rarely positive. *Only about ten to fifteen per cent of the cases diagnosed are in this stage* and most of these are discovered by the X-ray in the study of apparently well contacts or in the study of large groups of apparently well people. Rarely do patients in this stage feel sick enough to consult a physician. Most incipient cases should be in a sanatorium for a period of from four to six months. Practically all who have the proper treatment have a splendid chance of getting entirely well at comparatively little expense before becoming a source of danger to others.



FIGURE 3

J. S. Incipient adult type tuberculosis. T. B. infiltration left apex. No symptoms and no abnormal physical signs. Examined on account of exposure to brother who has positive sputum. Few in this stage contagious and practically all curable.

4. *Moderately Advanced Tuberculosis.* It is surprising how frequently patients, even in this stage of the disease, feel quite well and how many others have such slight symptoms that they pay them little attention. Many have slight cough and expectoration, which they attribute to a cold or to smoking, and many have other slight symptoms which they think are due to only temporary and insignificant causes. Most cases in this stage have positive sputum and have infected the other members of their household by the time their disease is discovered. The majority, but by no means all, have abnormal physical signs. Few in this stage are ever entirely cured. With proper treatment most of them can get their disease



FIGURE 4

I. W. Moderately advanced adult type. Patient the picture of health; on school basket ball team; examined in school clinic; occasional cough and expectoration; sputum positive; indefinite physical signs; two brothers and one sister dead T. B. Patient now taking pneumothorax in a sanatorium. Prognosis doubtful.

arrested, but it usually requires a year or more in a sanatorium, frequently with pneumothorax treatment or other forms of collapse therapy, and cautious living for many years thereafter. *About forty to sixty per cent of cases have the disease in this stage when the diagnosis is first made.*

5. *Far Advanced Tuberculosis.* In a large majority of cases in this stage there are both symptoms and physical signs and the sputum is almost always positive. Not infrequently, however, and especially in the negro race, symptoms may have been present only a very short time. In spite of the best treatment many of these patients will

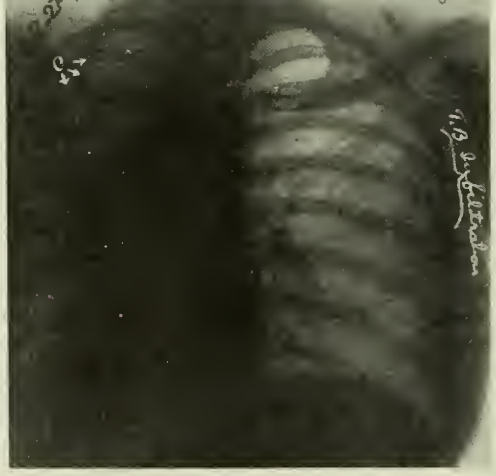


FIGURE 5

D. M. (col.). Far advanced adult type. Discovered in school clinic; temp. 100 plus; considerable cough and expectoration, though patient claimed she was not sick; sputum positive; extensive physical signs; now taking pneumothorax in a sanatorium. Lived with cousin who has T. B.; prognosis poor.

wage a losing fight. By years of curing and by having the advantage of collapse therapy many such cases will be improved. practically none can be cured, almost all are infectious and even under the most favorable circumstances it will require a great deal of time and money for them to get their disease under control. The fact that *thirty-five to fifty per cent of white and fifty to seventy-five per cent of colored victims of tuberculosis reach this stage before a diagnosis is made* is sufficient explanation of the fact that the great white plague continues to claim annually its victims to the number of three score thousand and more in our country alone.

What a tremendous difference, both to the patients and to the community, between the discovery of the disease in the early or the late stage! It usually requires a period of several years for tuberculous infection to develop into far advanced disease. Neither can the patient nor the physician say that there was not plenty of time for a thorough investigation of his case.

Patients frequently have early stage tuberculosis and not infrequently more advanced disease without having any very suspicious symptoms. Perhaps nothing emphasizes this fact more clearly than the large number of physicians themselves who have advanced tuberculosis before the disease is diagnosed. At the North Carolina Sanatorium forty-three North Carolina physicians have been diagnosed as having pulmonary tuberculosis. Of this number twenty-three per cent were classified as incipient, forty-four per cent as moderately advanced and thirty-three per cent as far advanced. Few, if any, diseases are so insidious in their onset.

Neither can we depend on the finding of abnormal physical signs for early discovery, even by physicians who are expert in physical diagnosis. Brown states that 503, or twenty-six per cent, of 1,900 consecutive admissions to Trudeau Sanatorium diagnosed as having tuberculosis had either no abnormal physical signs or insufficient signs for a diagnosis of tuberculosis. Of this number 322 were moderately advanced and 22 were far advanced.

The laboratory can assist us very little in the diagnosis of early tuberculosis because most early cases have no expectoration and in very few of those who do is the sputum ever positive for tubercle bacilli.

As above stated, hope for the discovery of any large proportion of cases in the early stage depends upon the study of contacts. When a physician discovers a patient with tuberculosis he should, of course, see that the patient gets the

best care possible, but the physician's greatest responsibility is in seeing that his patient does not further infect the other members of his household and in making a study of all contacts to find out which of them are infected and whether or not and to what extent any of the others have developed the disease.

The study should consist first in giving the tuberculin test to all the contacts, both adults and children, including the servants. Every practicing physician should familiarize himself with this test. It is both easy to give and easy to interpret. The tuberculin is very inexpensive and is frequently furnished free of charge by tuberculosis organizations or by local boards of health. The intracutaneous test is most reliable. If the test is negative in the dose of one milligram, tuberculosis and also tuberculous infection can be ruled out except in cases so sick that they have lost all power of resistance. Moreover, if an individual fails to give a positive reaction to one-tenth of a milligram intracutaneously, or even to the von Pirquet test, he is not likely to have any clinical tuberculosis. So, for practical purposes, in apparently well patients who cannot make several trips to the physician's office it is satisfactory to give one dose of one-tenth of a milligram intracutaneously. If this is negative, there is no likelihood that the patient has any clinical tuberculosis or any serious tuberculous infection.

A considerable proportion of adults and adolescents, especially in cities, will show a positive test and practically all who have been living in contact with an open case of tuberculosis will give a positive reaction regardless of age. It is always wise to give contacts the test, however, even though we know before hand that they will almost surely be positive, because the tangible evidence of infection as shown by a positive tuberculin reaction in all the contacts will make them more willing to bear the expense of the further studies needed, and will also cause the positive sputum case to be more careful about taking the necessary precautions to protect the members of his household from further infection. In rural communities quite a large proportion of adults will give negative reactions, which of course is most valuable diagnostic information since in such cases tuberculosis can be ruled out. During the last six years the Extension Department of the North Carolina Sanatorium has tested with a single dose of one-tenth of a milligram of old tuberculin intracutaneously 122,000 school children of all ages in all sections of the state, though a large proportion of the children were from rural communities. Only sixteen per cent of the total number gave positive tuberculin reactions. In one rural mountain county only 4.3 per cent of the 2,600 children tested gave positive reactions.

No further studies need to be made in negative reactors. All who have positive reactions should have clinical histories taken and physical examinations made—in children to discover other defects and in adults to discover other defects and any abnormal physical signs which may be present in their chests. Occasionally apparently healthy adult contacts will show physical signs which make the diagnosis possible without an X-ray.

The physical examinations should be made, but they cannot be relied upon fully to rule out tuberculosis.

In recent years the X-ray has replaced the stethoscope as our most valuable instrument of precision in pulmonary tuberculosis. Childhood type lesions can practically never, incipient adult type lesions can rarely and moderately advanced lesions can often be demonstrated only by the X-ray. Properly taken and correctly interpreted X-ray films are our most valuable means of diagnosing early lesions and of determining the extent and of following the progress of all tuberculous lesions. We cannot be sure that any individual with a positive tuberculin test does not have tuberculosis until he has had X-ray films made. The greatest difficulty about having films made is the expense, but if all who needed X-rays and are able to pay for them should have them made, roentgenologists could make them profitably at a fraction of their present charge. Even at present prices, however, it is infinitely cheaper for contacts to have X-rays made than to run the risk of having advanced tuberculosis before the disease is discovered. It is also much cheaper for communities to provide public clinics with X-ray facilities for those who are unable to pay private physicians than to allow the endless chain of wide spread infection and deaths from tuberculosis to continue. No doubt physicians can arrange to secure from roentgenologists special rates for families of moderate means, and especially if they report for their X-rays in groups on certain afternoons or during slack office periods.

Needless to say contact cases found to have active disease, in whatever stage, should be put on the rest cure, preferably in a sanatorium. All family physicians should familiarize themselves with the details of the proper application of the rest cure. Often patients have to wait months before they can be admitted to a sanatorium.

During this period of waiting many patients with favorable cases throw away their chances of recovery by failing to stay in bed. Only too frequently the physician as well as the patient is deceived by the rapid improvement in symptoms after the patient goes to bed. The patient looks and feels so well that he is restless to get up. We must remember that although symptoms improve rapidly the pathology in the lungs changes for the better exceedingly slowly. No matter how great the clinical improvement X-ray films rarely show much improvement in the lesions in less than five or six months. It is usually wise for the physician to tell the patient in the beginning that his symptoms will soon disappear on bed rest, but that if he gets up too soon the trouble will begin to spread in his lungs again. If the patient will keep himself under the care of a well informed family physician while waiting for admission to a sanatorium, he will improve and will shorten his stay in the institution. The long waiting lists of sanatoria could be relieved, too, if patients who are well situated at home to take the cure could after some months in a sanatorium be returned to the care of a well informed physician. A sufficient number of practicing physicians should also qualify themselves for giving pneumothorax treatment so that ex-sanatorium patients who need to continue this treatment for years can get refills of air without having to travel great distances. There will usually be enough cases needing refills in a city of any size or in counties of 50,000 population or more to make this profitable for one physician to handle all the cases.

Contact cases should of course be re-examined at intervals. Those who were found on first examination to have inactive lesions and all positive reactors who for any reason have had to continue to live in the home with positive sputum cases should have an examination and X-ray every year. This is especially true of the teen age group since it is during this period that infections and latent lesions are most likely to develop into active disease. All contacts having positive reactions should get a check up every few years even though they are no longer exposed to an open case.

Physicians should feel no hesitancy in urging contacts to come to them for thorough study. The progressive doctor should consider himself the guardian of the health of the families and of the community which he serves. He has no hesitancy in immunizing other unprotected children in the home when one of them develops diphtheria. He doesn't hesitate to vaccinate all the other members of the family when one member contracts smallpox or typhoid fever. It is no less important for the family and for the public that he make a study of all the contacts when a case of tuberculosis is discovered. Those unable to pay the private physician should be sent to a public clinic or to the health officer.

In addition to studying known contacts the family physician should of course study in the same way all of his other patients who present any suspicious symptoms or signs of tuberculosis. In children it is especially advisable for physicians to make frequent use of the tuberculin test. A number of pediatricians give the test routinely to all children who come under their professional care. In tracing back the possible source of infection in children who give positive reactions the physician not infrequently finds dangerous spreaders of infection who are not conscious of being sick or who have been diagnosed as having only chronic bronchitis.

Another source of discovering many early stage cases, both of the childhood and of the adult type of tuberculosis, is through the study of large groups of the apparently well, such as school children, college students and industrial workers. In every such large groups studied there will likely be several with latent tuberculous lesions. By having such individuals take more rest and avoid as much as possible unusual stresses and strains most of them can pursue their activities, while they might otherwise have breakdowns. An occasional case with active disease who is a source of danger to other students or workers will be discovered in such clinics. Perhaps the conduct of such clinics as these will continue to be largely the function of official and voluntary agencies. The family physician can always do much toward making such studies a success, however, by lending them his moral support and by co-operating in the follow up of those who are referred to him for the treatment of other defects as well as for tuberculosis. He can in this way not only render useful public service, but he can also add materially to his income.

Physicians interested in improving their knowledge of tuberculosis will find the National and State Tuberculosis Associations always ready to assist them in any way possible. They will gladly furnish a list of the most authoritative books on the various phases of tuberculosis and they have available, at only a few cents, a number of excellent informative pamphlets for the physician's own use, and helpful literature for the use of his patients. Every physician who is not familiar with this form of tuberculosis should

have their small pamphlet, "The Childhood Type of Tuberculosis," (costing only 20 c) which gives the modern classification of tuberculosis, explains the use and the interpretation of the tuberculin test, gives illustrations of positive tuberculin tests and X-rays of the various forms of tuberculosis. The officials of public tuberculosis clinics and sanatoria are usually glad also to give physicians first hand instructions in the diagnosis and treatment of tuberculosis and free consultation service on any doubtful X-ray films, or on any of their patients who are unable to go to a private specialist. Within recent years also excellent special courses in tuberculosis, lasting only a few weeks, have been provided in tuberculosis centers in different parts of the United States. These courses are not expensive and general practitioners will be well repaid by taking advantage of the opportunities which they afford.

Tuberculosis offers a challenge to every member of the medical profession. This one disease still causes one-fifth of all deaths between the ages of fifteen and forty-five, besides a full share at all other age periods. When physicians generally accept the challenge by making intelligent application of the knowledge which is already available, tuberculosis will probably be reduced within a period of twenty-five years or less to one of the minor causes of death.

THE TUBERCULOSIS PATIENT*

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WHEN tuberculosis is suspected by an individual or when this same patient feels run down and in need of a spring tonic, the family physician flashes before the mind and is immediately consulted. We assume that all family physicians are good doctors. We take it for granted they are painstaking and thorough in their examinations. We believe when they are ready to impart their conclusion to the invalid they have given the best advice that is within their ability to render. And if we are right in our assumptions, the patient is fortunate indeed.

However, we must be wrong in admitting that all family physicians are careful doctors.

Else, why do 80 per cent of tuberculous patients discharged from one institution of excellent standing die within three years of discharge?

Why are 60 per cent of cases coming west in search of climate in the far advanced stage of the disease?

Why do 47 per cent of these same patients die within six months of arrival?

The answer to the foregoing questions is: Lack of early diagnosis. Tuberculosis to be cured must be diagnosed early. Ninety per cent of early type cases get well, the other ten per cent die because of poor advice or because they did not take good advice. The family physician is the first line of defense against a beginning tuberculosis. If he fails, the story is a long drawn out fight against overwhelming odds, usually ending in hopeless invalidism or, far better, the grave.

Too many busy practitioners are heedful of their time at the expense of the patient. They ask a question or two, write a prescription, walk to the door, and ask for the next victim, all in the space of a few minutes. The individual seeking advice may have had nothing organic the matter or he may have been dying of cancer. As far as his doctor's contact with him was concerned, certainly the doctor was none the wiser. One cannot see dozens of patients in the course of an afternoon at the office and give intelligent advice.

A medical friend of mine once said: "Deliver me from the busy doctor. He never has time to find out what's the matter with a patient." And there is much to be said on that side. On the other hand, if we selected our medical adviser by that rule, we should no doubt take up with one who had little practice due to his natural dumbness. In the final analysis, the patient and not the physician gets the wrong end of the wishbone.

What the reliable and competent family physician needs to remember is to give sufficient time to the new patient to arrive at some definite conclusion. If today is too full of work, have him come back. No one is expected to make a diagnosis in one interview unless a label from objective symptoms stares you in the face and only a blind man could miss it. A carefully taken history is a big asset. Only recently a boy came to my office giving a history of having been treated by three physicians over the past two months for a bronchial cold. From the history, it was easily learned that shortly after his cough began he suddenly spit up a large quantity of foul-smelling and foul-tasting pus. Physical examination revealed numerous rales at the lower angle of the scapula, and X-ray confirmed the diagnosis, made from the history alone, of abscess of the lung.

Too many cases of lung abscesses are given the diagnosis of bronchitis, early tuberculosis, and

*Prepared especially for THE JOURNAL-LANCET.
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what not. Careful checking by X-ray and laboratory, and in the majority of cases by history alone, will help to make the diagnosis positive.

Another bugbear is the toxic goitre. My records are full of patients with this condition sent west for an early tuberculosis simply on the finding of a low-grade afternoon temperature and a rapid pulse. The X-ray and physical examinations are both negative as far as tuberculosis is concerned, yet a pulse rate and temperature chart is sufficient for the busy man to hang tuberculosis on the victim, when a further study would have revealed the true state of affairs.

Beware also of the case of bronchiectasis. This has labeled many unsuspecting people with pulmonary consumption. Here X-rays with lipiodal and carefully checked sputum give vast information and save the doctor much embarrassment.

Malignancy of the lung is more cause for grief, and here one may be pardoned for thinking of everything else until the X-ray begins to tell the story. However, one's inability to pin a definite diagnosis in an obscure pulmonary affair should suggest new growth as a plausible possibility.

The rarer lesions due to fungi need worry no one. They are met so infrequently that confusion seldom results.

Pulmonary fibrosis due to occupational diseases as silicosis and pneumokoniosis are usually cleared up by history, X-ray and laboratory examinations.

Now let us consider the great stumbling block in differential diagnosis, namely, the case of chronic nervous exhaustion. For years I have maintained that there are born into this world people with sub-normal endurance. The gentler sex predominates, but males are also encountered. They present a symptom complex that in itself is almost diagnostic. After you have listened to their story, you might well conclude that no organ of the individuals' anatomy has escaped untouched. The numerous aches and pains begin with the hair on the head and end at the toe nails. Chest pains come in for their share of the picture, and especially a pain at the angle of the scapula. This is so common and so constant after exertion that I choose to call it a fatigue pain. Add to this vast array of symptoms a low-grade afternoon temperature, plus under-nourishment, a mildly accelerated pulse on exertion, and marked fatigue at the end of the day, and you will find that 90 per cent get a diagnosis of pulmonary tuberculosis, usually of the hilum type, hung onto them. This in the absence of X-ray, physical or laboratory findings to back up the assumption. A carefully taken history will show that the majority of these patients have been in this same chronic state for years. This fact alone should make one suspicious that organic disease does not exist. True, all patients of this type should be carefully studied and other possibilities such as toxic goitre ruled out before definite conclusions are reached. This class of patients make for excellent sanatorium results and I suppose their incarceration in an institution temporarily saves them from the surgeon's knife, since this branch of medicine usually removes most of their internal workings in a vain endeavor to cure all their imaginary ills.

The foregoing remarks on differential diagnosis are offered to show the family doctor the errors that come to the specialist in pulmonary disease, and not with the idea of making a phthisiologist of him.

It is much better to err on the right side than the wrong, but it is also unfortunate to hang a diagnosis of tuberculosis on an individual in whom it does not exist.

The general practitioner must of necessity see the patient first in the majority of cases. He must exercise ordinary intelligence in the management of the case. He may in justice to himself and patient watch the early type for a time, and if improvement is consistent keep on with the case. If not, reference to a specialist is indicated.

The progress in the treatment of tuberculosis in the past decade has been so rapid that the general practitioner could not be expected to keep pace with it. That, however, does not excuse him from availing himself of the benefit of consultation.

To the old regime of rest, fresh air and good food has been added the so-called compression therapy. In the early days probably not more than five to ten per cent of patients were given this added advantage, but today in some institutions fully 80 per cent are selected for some form of compression. Phrenicectomy, artificial pneumothorax and thoracoplasty play an important part in treatment, and the physician who fails to recognize this is criminally negligent and is not giving to his patient the best that medicine and surgery has to offer in the treatment of tuberculosis.

UNNECESSARY FAILURES IN TUBERCULOSIS WORK*

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MANY years ago, Dr. F. C. Shattuck, at that time professor of clinical medicine at the Harvard Medical School, in discussing the prognosis of pneumonia said to his students: "Gentlemen, there are 40 per cent of patients with pneumonia, who are going to die regardless of treatment; there are 40 per cent who will recover untreated or even uncared for; the middle group, 20 per cent, may get well or die depending on good nursing and good doctoring." This statement, with perhaps some change in the figures, applies equally well, at the present time, to tuberculosis. Granted then that out of any given number of patients with pulmonary tuberculosis, some are going to die and some are bound to get well regardless of good or bad treatment, there remains a middle group whose future health and welfare depend on the advice and information they receive and their willingness and ability to take advantage of it. It is in this group that our unnecessary deaths and failures are to be found. In thinking over this subject, I was reminded of a remark once made by the late Sir Marcus Paterson, then director of the Brompton Sanatorium in England. In an informal discussion of this question, Sir Marcus said to me: "Dr. Hawes, there are two classes of consumptives whom I will not treat and who will never get well. They are alcoholics and damn fools!" Many times when dealing with a skeptical or recalcitrant patient I have told this story and have ended by saying: "My friend, I do not believe that you are an alcoholic," leaving the patient to draw his or her own conclusion. One might infer from the above that I thought that there are many of the "d. f." class in the world. Although this is quite true, I feel that they are by no means confined to the laity. As time goes by I am not so sure as I was twenty-five years ago, that in the majority of cases it is the patient's fault and not the doctor's that the end results are bad. More and more I am of the opinion that the blame for our failures must be divided and that a part, and in many instances a large part, must be borne by the medical profession.

There are four reasons why consumptives in the group here under discussion do poorly. These are:

1. Refusal on the part of the patient to accept or failure to understand the diagnosis of tuberculosis and all that it means.
2. Refusal by the patient, granted that the diagnosis has been made clear to him, to take proper treatment in a sanatorium or elsewhere.
3. Refusal or inability of the patient to continue treatment for a sufficient length of time.
4. Ignorance on the part of the patient of the necessity of keeping under close medical supervision after discontinuing active treatment.

These I will discuss more in detail.

1. *Refusal to accept or failure to understand the diagnosis of tuberculosis.*

Any physician, who has practiced medicine for twenty-five years or more, will have met with almost every type of human being, native and foreign-born, rich and poor, intelligent and ignorant. In my own case which covers more than this period, I can recall almost no patient who was unable to understand, or, of still greater importance, who was unwilling to accept a diagnosis of tuberculosis. Although perhaps grudgingly, rebelliously and even skeptically, if the facts were presented clearly, simply and honestly, only in the rarest of instances has the patient failed to understand the exact situation. Of this I am certain. Often one had to be brutally frank or childishly simple in choice of language. Wailing and tears were frequent accompaniments to telling the truth. I am firmly convinced, therefore, that if the physician really wishes his patient to know the exact diagnosis of his case, no amount of stupidity, ignorance of the language or any other factor should prevent the accomplishment of his aim.

Why is it then that those of us who are specializing in this subject are constantly seeing patients who have been through the hands of not only one but many doctors and who nevertheless have only the vaguest ideas, if any, as to what really ails them? To me the answer is clear and plain. Either the physician does not know the exact diagnosis which is quite excusable or else, which is not excusable, he is unwilling to tell the truth to the patient or what is worse veils it in such language that the patient remains in ignorance of his condition and its seriousness. How often has every sanatorium physician or specialist heard patients say: "No, doctor, he did *not* tell me that I had tuberculosis and certainly not that I had consumption, but that all I had was a little 'spot' on my lung." One might

*Prepared especially for THE JOURNAL-LANCET.
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well say with Macbeth, "Out, damned 'spot'!" This and similar expressions, "lungs a little weak," "one apex slightly affected," "a little haziness at one top," etc., have too often meant prolonged invalidism or even death to the patient. After all it is only human nature for a patient, worried and apprehensive, to seek to avoid hearing and accepting an unpleasant truth. It is certainly the doctor and not the patient who is responsible for many of the failures that so often occur in this group.

2. *Refusal on the part of the patient to take proper treatment.*

Here, one may quite properly blame the patient more often than the doctor for bad results. The only criticism of the medical profession that one might make is that physicians are not sufficiently good salesmen. Too often through lack of knowledge and experience they are unable to sell to the patient the idea that sanatorium treatment or its equivalent is necessary. They do not know or take the trouble to impart the necessary information, the details as to how to get into a sanatorium, its cost, location, accessibility, etc. This is shown by the following incident. Early in my practice I took a young man with tuberculosis to consult with Dr. Shattuck whom I mentioned, earlier. The interview was short and the advice given brief and succinct. "Well, Hawes," said he, "The diagnosis is clear enough. This evidently means Saranac, Liberty or the West." That was all. I had heard of Saranac as a village somewhere in the Adirondacks but never of Liberty except as a much abused word while to me at least "the West" simply meant something "wild and wooly." To Dr. Shattuck this was doubtless all clear enough; to the patient and to me his advice was worth very little indeed.

Another reason for failure, which in New England at least, is becoming less common, is the habit of many doctors to advise the patient "to go to the country, drink plenty of milk and eggs and to live a simple outdoor life." Our New England graveyards are peopled with those who have received and followed such advice. With the increase of sanatorium facilities, this, I am glad to say, is becoming less and less common. On the whole, I feel that the blame for failures among this group, comprising those who are unwilling to take proper treatment belongs to the patient rather than to the doctor.

3. *Refusal or inability of the patient to continue treatment for a sufficient length of time.*

The primary reason why patients leave sanatoria and discontinue treatment too soon is, of course, an economic one. The man feels that he must go back to support his family; the wife must return to manage her home and take care of her children. Here again it takes good salesmanship on the part of the physician to persuade the patient that in the end it will be better for him to continue treatment a few months longer. Likewise, enlarging the activities of our sanatoria to include social service work in the homes so that the patient is assured that his family is well cared for, etc., will go a long way to minimize this defect in our present system. Of course, there are, and always will be, numerous patients utterly short-sighted, who despite warnings and for no sound reason discontinue treatment. Almost invariably they do badly. On the whole it is our present system, or rather, the defects in it which we must blame for failures in this group.

4. *Ignorance on the part of the patient of the necessity of keeping under close medical supervision after discontinuing active treatment.*

In a recent article[1] I discussed what one might call the danger period in the treatment of tuberculosis. The failure to recognize this danger period is undoubtedly one of the greatest reasons for relapses. Nowadays, almost every well-run sanatorium has some system of "discharge letters" by means of which the local health board and the patient's physician are notified of the discharge of any given patient. In this letter are given details concerning the patient's physical condition, the presence or absence of bacilli in the sputum along with pertinent remarks as to his ability to work, etc. Such letters undoubtedly do a certain amount of good but from my experience both as one who saw such a system originated in Massachusetts when secretary of the State Tuberculosis Commission and now as a physician specializing in tuberculosis I believe that the good they do is very limited. So important a matter as this cannot be taken care of by any correspondence method. Only a personal interview, or rather, a series of interviews with the patient and his family—parents, husband, wife, brother, or sister as the case may be—can serve this purpose while in addition there should be a letter, and not a perfunctory rubber stamp one, to the family physician giving necessary medical information. Sooner or later I hope to see at every sanatorium and health resort some one person, a physician, social worker or nurse, whose duty it is to interview each patient prior to his departure and to tell him clearly and in

[1]The American Review of Tuberculosis, Vol. XXI, No. 4, April, 1932.

detail the dangers that lie ahead and to explain to him his limitations, what he can and cannot do with safety, how to safeguard against infecting others, the need of rest, the dangers of exercise, advice as to sex life, and above all, the absolute necessity of constant, medical supervision. Only in some such way as this can relapses be prevented. I was once asked by the Secretary of the Boston Tuberculosis Association how long after discharge from our Preventorium the children should be visited and supervised in their homes. "Until they die of old age," was my reply, which I believe to be an eminently proper one. Whatever method or means is used, if we are to prevent the present high rate of relapses that bring discredit to our sanatoria and cause the public very justly to lose faith in them, we must in some way impress clearly and indelibly on the patient's mind that his stay in the institution is but the beginning of treatment and that the difficult and yet most important part comes later and requires close medical supervision for months and indeed for years.

In the foregoing remarks I certainly do not wish to give the impression that tuberculosis would disappear and every patient would get well if these obstacles to success in our work were removed. Far from it. But I do maintain that at present many of our failures are unnecessary ones. I am sure that if every physician who makes a diagnosis of pulmonary tuberculosis or who is treating and taking charge of tuberculous patients would see to it that the points I have referred to here were properly emphasized and understood our results would be much better and our failures fewer than they are now.

To Summarize

1. There are many unnecessary deaths and much prolonged illness from tuberculosis in the group here under consideration.

2. In every case of tuberculosis the physician should make absolutely sure that the patient or *some member of his family* knows the exact diagnosis and understands its significance.

3. The details of treatment should be made clear and the ways and means of obtaining sanatorium treatment fully explained.

4. The patient should be made to appreciate the fact that tuberculosis is a chronic disease requiring not days or weeks but months and often years of treatment.

5. The physician should warn the patient about to return home and to work of the dangers of this convalescent period and of the absolute necessity of keeping under close medical supervision.

TUBERCULOSIS TREATMENT; OUR CHANGING VIEWS*

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FOR AS many years as some of us care to remember the treatment of pulmonary tuberculosis has been generally expressed by the tested triad—rest, good food and fresh air. So simple, so easy and so enticing has this formula appeared that a common practice not many years ago, and more especially among general medical men, has been the simple instruction of tuberculous patients to go "to the country," rest as much as possible and eat plenty of good, wholesome food. So simply instructed some patients recovered but many died, victims of excellent general principles improperly applied. Others, more fortunate, received the benefit of sanatorium care, rested in the open air, became afebrile; exercised, became febrile, rested again and ultimately either recovered or failed to do so. Thus one of the chief characteristics of tuberculosis appeared to be the tendency to relapse and remission, the former as well as the latter to be accepted in a proper spirit of resignation.

Today our viewpoint is quite different. Relapses during the course of treatment, while common, are not regarded as inevitable. The proper appreciation of the fundamental pathological changes involved in the disease, the careful use of commonly available diagnostic and prognostic procedures should make the occurrence of exacerbations during the course of treatment of the *co-operative* tuberculous patient a sourse of personal chagrin to the physician. In brief, the modern concept of the treatment of pulmonary tuberculosis might well be summed up as the *intelligent anticipation of future intrapulmonary changes and the attempt to favor or forestall them.*

The earlier ideas of tuberculosis treatment are chiefly remarkable for their similarity to quasi-modern views. Thus we find that the ancient Greeks treated tuberculosis in a manner somewhat similar to that extensively used in this country only a decade or two ago. Rest, a liberal diet and change of climate occupied a prominent place in their scheme of therapy. Gentle exercise was used as soon as patients appeared able to endure it. Moreover, milk, particularly goat's milk, also occupied a prominent place in therapy and, interestingly enough, cow's milk was said

*Prepared especially for The Journal-Lancet.
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to be less beneficial than the milk of the goat. In speaking of milk Hippocrates in the "Book of Aphorisms" remarked, among other things, that "it is suitable for consumptives who do not have much fever; one should also give it in light fevers and those of long duration when none of the symptoms just spoken of exists but emaciation is excessive."[1] Later on Laennec was extremely skeptical of most of the remedies proposed for the cure of consumption, for although he recognized the efforts of nature to heal tuberculous lesions by the production of scar tissue, he doubted the actual curability of phthisis even in its early stages. Nevertheless, he recognized that certain patients lived for many years after the development of pectoriloquy or other abnormal signs in the chest.

The modern treatment of tuberculosis, however, may be said to have begun with the inauguration of sanatorium therapy by Hermann Bremer in Germany, who opened the first sanatorium at Goebersdorf in Prussia in 1853. Yet it remained for Peter Dettweiler to recognize and apply what may be considered the forerunner of modern rest treatment in his own sanatorium established at Falkenstein in 1874. In our own country we are accustomed to look back to the pioneer work of Edward Livingston Trudeau, which began with the opening of the "Little Red Cottage" at the Adirondack Cottage Sanatorium in 1884, as one of the most important milestones in the development of our national tuberculosis consciousness. While not the first sanatorium in the country, it was the first of its kind and has since been widely copied. Not the least of its accomplishments has been the fact that under Dr. Trudeau's direction it served as the nucleus for the establishment of a center for the development of tuberculosis thought and research which has extended its influence throughout the world. It was here that rest principles were developed and applied. It was here also that the question of activity began to receive the attention which it so richly deserved. For if one neglects the controversial forms of pulmonary tuberculosis therapy, such as tuberculin and other more ephemeral substances which have had their day on the tuberculosis stage and are now all but forgotten, one remains impressed by the fact that one of the first stumbling blocks to successful treatment has been the absence of criteria by which one might judge the necessity for rigid treatment or the mere desirability of a modified and more hygienic life.

For years it has been recognized that the tubercle bacillus produces infection as manifested by the skin reaction to tuberculin and that it also produces more or less obvious disease betrayed by various symptoms and signs. It was the necessity for evaluating the meaning of the latter which led the Saranac group to begin their study of clinical activity. As they put it their object was "to define, if possible, clinical activity in such a manner that it might be of use to those engaged in ordering the life and affairs of tuberculous patients."[2] They pointed out that at this time (1919) it was no longer sufficient to diagnose the presence of mere clinical tuberculosis. The problem was constantly recurring in sanatoria and, it might be said, in private practice as well. For this reason they attempted to express views which had been maturing for a number of years and which represented the opinion of thoughtful workers in tuberculosis at this particular time.

The Activity Period

We may well stress this period of the latter part of the second decade of this century and the earlier years of the third as the activity period in tuberculosis thought, when the question of the presence or absence of clincal activity occupied the center of the stage as far as treatment was concerned. Brown, Heise, Petroff and Sampson properly divided activity into pathological and clinical activity. They held that pathological activity "denotes that stage of a tuberculous process in which some change is taking place whether progressive or retrogressive." Moreover, they assumed that pathological activity might always be safely assumed when clinical activity was present, but that pathological activity might exist for varying periods of time without any evidence of clinical activity; and further that "retrogressive pathological activity could continue long after the evidences of clinical activity had ceased." They stressed the importance of laboratory findings and roentgen changes in the determination of pathological activity but apparently felt that for purposes of treatment clinical activity was the important factor.

A number of things were held to indicate pathological activity which did not necessarily mean clinical activity to this group. The occurrence of tubercle bacilli in the sputum usually indicated pathological activity but their absence was not held to exclude it. They felt that in as high as 70 per cent of their cases without bacilli and even without sputum pathological activity might be present. Bacilli in the stools had the same significance. A pleural effusion to these

workers indicated pathological activity. A complement fixation test was also thought to be of some value in the establishment of this form of activity. By far the most important criterion, however, was the roentgenogram. In regard to this procedure these workers pointed out that pathologically active tuberculosis differed from healed tubercle or scar and that certain characteristics such as the "cotton ball appearance" indicated an active or recently active lesion, whereas the disappearance of the cottony appearance and hardening of shadows indicated retrogression and finally, when changes no longer took place, the complete absence of even pathological activity. When the film no longer revealed changes from week to week or month to month, it was felt that the ultimate changes had taken place and that inflammatory reaction no longer played a part in the picture.

Clinical activity, on the other hand, meant to this group the absorption of poisons to such an extent that symptoms were produced. These symptoms in turn were divided into cardinal and subsidiary. The cardinal symptoms were taken to be fever, rapid pulse, pleurisy, hemoptysis, lack of endurance, loss of weight and night sweats. The subsidiary group was chills, cough and expectoration. It is of interest that these workers found that if tubercle bacilli were present in the sputum, clinical activity was three times as likely to occur if rales were present. If tubercle bacilli were not present, they found that clinical activity was found in only one-fifth of the cases whether rales were found or not. Clinical activity apparently bore no relation to sputum whether rales occurred or were absent. In cases with or without sputum rales seemed to be of little importance. In short, it appeared that the effort to determine the presence or absence of clinical activity was one largely to be considered as a manifestation or toxemia of a greater or less degree, particularly as manifested by fever or rapid pulse or both.

The first characteristic of this period then was the regulation of the amount of rest and physical activity almost wholly by the present or absence of cardinal symptoms. When cardinal symptoms were present, patients received rest in large doses. When absent, exercise in varying amounts, depending upon the judgment of the individual clinician, was employed.

The Type Period

Worthy as was the effort to evaluate the importance of pathological and clinical activity and important as was the stress placed upon the presence or absence of cardinal symptoms, it became increasingly apparent to many workers in the field that the presence or absence of symptoms offered an insecure basis in many cases for the proper evaluation of treatment. It went without saying that the presence of cardinal symptoms demanded absolute rest but it appeared equally true that trouble promptly returned in many patients as soon as rigid measures were relaxed, apparently in the absence of any symptoms whatsoever. This led to the attempt to relate the pathological picture as manifested by the combination of history, clinical findings, symptomatology and roentgen findings to the course of therapy to be adopted. It appeared from the work of Gräff and Küpferle[3] that the information obtained from serial roentgenogram, together with the knowledge derived from pathological material, might well be used in Intelligent treatment, at times wholly without reference to symptomatology.

Fraenkel in 1904 and Albrecht in 1907 attempted to separate pulmonary tuberculosis into two types—the exudative and proliferative, or productive. The classification was adopted by Aschoff and his school at Freiburg and was used in clinical—pathological evaluation by Gräff and Küpferle. In 1924 the writer[4] began using this classification as an aid to treatment, pointing out certain fundamental differences in the treatment called for by each type with, he felt, improved results. Table I summarizes the clinical differences in these two type of lesions.

The applicability of this schema as a guide to treatment was made possible by the improved technique of taking X-ray films. The fact that this technique advanced by leaps and bounds during the last decade made the classification of many cases relatively easy. Indeed, the growing importance of properly taken roentgenograms in the entire field of pulmonary tuberculosis has been most excellently discussed by Brown and

TABLE I
CLINICAL DIFFERENCES IN EXUDATIVE AND PROLIFERATIVE LESIONS

	Onset	*Breakdown*	*Course*	*Cavitation*	*Treatment*
Exudative.	Usually catarrhal, mild or severe.	Recent.	Favorable—resolution. Unfavorable—rapid extension.	Early with thin walls.	Rigid.
Proliferative.	Usually insidious.	More remote.	Favorable—static lesion. Unfavorable—slowly progressive.	Late with fibrous walls.	A modified life.

Sampson.[5] This discussion clearly illustrates the increasing value in their minds of roentgenogram. For example, in 280 cases diagnosed as minimal tuberculosis they found the roentgen findings positive in 99 per cent while bacilli were present in only 35 per cent, rales in 27 per cent, hemoptysis in 28 per cent and effusion in 12 per cent. They particularly stressed the relative unimportance of physical signs in estimating the need for treatment as compared to the valuable evidence offered by the roentgenogram in making a decision as to proper therapy.

The Exudative Form

The exudative form begins with an infiltrate of leucocytes and cells from the alveoli, atria and bronchiols which forms a coagulable exudate. Extension into fresh areas of the lung is favored by the unstable nature of this material, which facilitates aspiration into new areas. Consequently, as might be expected, progressive or retrogressive changes take place readily from the very nature of the process. If retrogression occurs, there may be:

1. *Resolution.* Before much damage has been done to neighboring tissue the exudate may be liquified, in part expectorated and in part borne away by the lymph stream. In this case functional and even anatomical restoration is possible. Virchow undoubtedly recognized this process. Gardner has demonstrated it in animals, remarking "It is not yet demonstrated that human pulmonary tuberculosis, being, as it usually is, an autogenous re-infection upon sensitized soil, most often with virulent organisms, can likewise heal by resolution. The steps in the proof of such a process are lacking, but an experienced clinician has seen the lesions of pulmonary tuberculosis disappear before his eyes, leaving no trace that he can detect by X-ray films or by physical signs." Certainly positive proof of this character is very difficult to obtain in human beings. Nevertheless, it seems to me that clinical and roentgenological observations justify the use of the word resolution in this connection, since even lobar pneumonia, in which the term is commonly employed, often leaves roentgen shadows for varying periods of time after patients have become clinically well.

2. *Partial resolution with a change to the productive type.* Incomplete "resolution" may take place and the lesion only partially disappear. In these cases it may be assumed that part of the exudate is removed, but that a proliferation of the fixed tissue or lymphatic elements begins, leading to a change in the character of the focus.

3. *Caseation followed by healing.* Cellular elements in the center of the focus break down under the influence of ferments and the neighboring alveolar walls are destroyed. The center of the focus becomes a homogeneous, caseous mass so that complete anatomical restoration is impossible. This caseous material may be absorbed, inspissate or calcify. This latter process may be partly progressive and partly retrogressive in character. If progressive changes occur, caseation may be followed by cavitation. Ferments liberated by the destruction of leucocytes liquify the caseous material and excavation follows, leaving a fresh, thin-walled cavity, whose extent depends upon the extent of the original caseous focus.

The Productive Form

The productive form is probably a reaction to bacilli in a less sensitized soil. In the beginning the foci are small, usually located in the apex in early cases, and coalesce to form clinically recognizable tubercles. Epithelioid cells may appear early and the typical Langhans type giant cells are formed through the coalescence or splitting up of a number of such cells. It is said that the greater the productive character of the lesion, the greater the development of the giant cells, both as to size and the number of nuclei. The following changes occur:

1. *Fibrosis.* Through fibroblastic proliferation a nodule develops, with more or less hyaline change, which may be well encapsulated.

2. *Caseation* may occur at the center of the tubercle, to become encapsulated later.

3. *Slow extension.* Fresh areas of involvment constantly occur.

4. *Ultimate massive scarring.* Deformities or firm-walled cavities develop.

It is often surprisingly easy to differentiate the type from individual foci. Unfortunately, an entire lung containing any number of foci offers a more complex problem. Thus typical productive foci may exist coincidently with fresh areas of tuberculous pneumonia or exudative foci (Fig.4). The latter in turn may partially absorb, but fibrosis may develop, leaving scars, so that various combinations constantly occur until it may be impossible to declare with certainty that any one character predominates. The dose of bacilli and their virulence, the character of the soil and the manner of spread, together with the inherited and acquired resistance, all unite to vary the reaction.

Differentiation

A stormy onset usually characterizes the onset of exudative pulmonary tuberculosis, the intensity of which is usually determined by the size of the area involved. Thus a single lobular-exudative lesion, readily discernable by X-ray, may have an onset just as abrupt, but infinitely milder than a large collection of such foci. Fever usually occurs at the onset. The productive type, however, usually begins more insidiously and in the beginning fever may be conspicuous by its absence.

In both types the early lesions may cause no physical signs whatever. Dr. Davis and I have been particularly impressed by this characteristic in studying truly early lesions as revealed by routine roentgenograms of the University of California nurses (6). In general, however, if physical signs do occur with exudative lesions, they are apt to be intense and well localized over the involved area. Diffuse signs are more apt to occur with proliferative lesions.

Exudative lesions which retrogress pursue a surprisingly uneventful course. Cough and sputum may be entirely lacking and after a few days both the temperature and pulse rate may fall to normal. Yet if progressive changes continue to occur the stormy onset may be but the prelude to an equally stormy course, with high fever, rapid pulse, sweating and the usual symptoms of pronounced toxaemia. In these cases one should be particularly observant of sudden sharp elevation of temperature, which usually characterize fresh areas of invasion.

Productive lesions which retrogress do so more slowly, with a slower fall in the temperature curve and pulse rate. Subsequent elevation of temperature are milder and do not necessarily mean invasion of uninvolved tissue. Progression is evidenced by the usual symptoms of gradually increasing toxaemia.

Roentgen differentiation is of the utmost importance. For this good films are requisite and stereo films are of great help. The acinous-exudative lesion is finely distributed and soft, but hard to differentiate because of the minute character of the lesions. In these cases symptomatology offers a clue. Lobular-exudative lesions are soft, often with clean-cut borders and about as large as one's thumb nail. Large numbers of such foci blend into each other almost imperceptibly. Caseation accentuates the center of such lesions while excavation is usually readily detected by increased radiability. Productive foci are generally more sharply outlined than exudative foci, are of variable size and do not blend in such an indefinite manner. They may be nodular or linear in character.

During the progress of the case the roentgenogram manifests striking changes. In the exudative form, resolution is evident from the total disappearance of the foci. Caseation is evident by an accentuation of the central portion of the shadow, which may become divisible into two components, the inner caseous mass and the outer exudate. In the productive type there may be a general hardening of the shadows, although since the central portions may caseate or simply become firmer through fibrosis, it is impossible to differentiate the latter change through the roentgenogram.

Type Treatment

The fundamental differences in the employment of type treatment are summarized in a word in Table I. Since exudative cases are often asymptomatic, the absence of symptoms is of little value in outlining therapy. The presence of fever, rapid pulse, anorexia and the like call for rigid bed rest but bed rest may need to be enforced long after these symptoms have disappeared. The specific application of type treatment may best be illustrated perhaps by concrete examples, the selection being based not upon the rarity of the case but the fact that it typifies a common type frequently encountered.

R. R., female, in her late teens (See Fig. 1), a university student. History of catarrhal onset of a few weeks duration, followed by a small but brisk hemoptysis, which led her to seek



FIGURE 1

Early exudative lesion in the lower part of the right upper, with cavitation behind the second rib. Hemoptoic onset in a girl of nineteen. After initial hemoptysis entirely asymptomatic.

medical advice. X-ray film as illustrated reveals the usual, soft, cottony, exudative lesions with a small cavity behind the second rib anteriorly and the process most marked at the periphery of the lung field. When first seen this girl had no symptoms whatever nor did she at any time during her treatment have any of the cardinal symptoms previously mentioned. After three months in the sanatorium, followed by three months rest at home, her lesion entirely cleared with the exception of a slightly thickened pleura between the right upper and middle lobes and a few strands of fibrous tissue in the previously involved area. She returned to school, to her old mode of life, neglected her care, dieted to regain her slender figure and within a year broke down with a similar process in the left lung. The routine was then repeated. The important thing in this case was the fact that there were no symptoms whatever, aside from the initial ones at any time during her illness. Repeated roentgenograms offered the only guide to treatment.

P. M., a young woman also in her late teens, with an initial history of hemoptysis coming out of a clear sky without physical signs (See Fig. 2). Roentgenogram revealed a fresh, soft-walled cavity lying beneath the clavicle in the periphery of the lung field on the right side, another typical exudative lesion without symptoms but differing from the above case in the fact that even on strict bed rest the cavity gradually enlarged. Pneumothorax was therefore induced and the patient's subsequent course was uneventful.

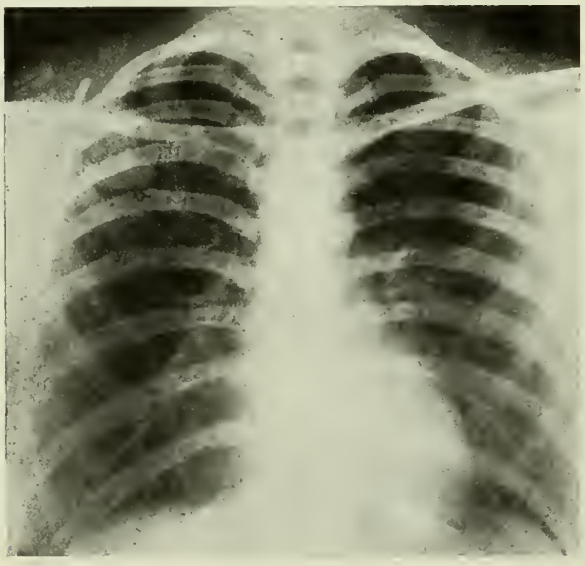


FIGURE 2

Exudative lesion in the right upper with early, fresh cavitation, in a young woman of twenty. Catarrhal onset with symptoms of brief duration. During strict bed rest, cavity enlarged. Clinical cure with compression.



FIGURE 3

A predominantly proliferative lesion, involving chiefly the right upper but distributed throughout both lungs, in a woman of forty-five. Insidious onset with mildly febrile course for several months. For the past five years this woman has been leading a normal life, but the character and extent of the lesion, as far as x-ray evidence is concerned, have not changed since she was first seen, six years ago.

A. V. T., a woman of 45, having an insidious onset at some period several months, possibly several years, before; it was impossible to determine exactly when the lesion began, but it was picked up on routine physical examination because of the presence of a few piping rales here and there in the chest, and because the woman had a rapid pulse and slight pyrexia (99.4). Roentgenograms revealed the widespread, diffuse, hard, proliferative character of the lesion as noted in Fig. 3. This is the type of process in which little change, roentgenologically speaking, can be expected. Accordingly it was found that on bed rest symptoms disappeared but there was no change in the roentgen picture. After three months in bed, during which all symptoms ceased, the patient was allowed to be up and about but warned that her future lay in a modified life with periodic observation. After two years she felt so well that she decided observation was no longer necessary. She was next seen three years later, complaining of a painful swelling on the left side of the face which had arisen after she had struck her face against an open door. The lesion was at first thought to involve a tooth, which was extracted without benefit. An orthopedist was then to operate upon the jaw. The patient, however, returned to her own physician, Dr. F. H. Kruse, who put

her in the University of California Hospital, where the process was found to be tuberculous in nature and to involve the soft tissues of the cheek. A roentgenogram taken at this time revealed more extensive changes in the lungs, which, however, had not changed in character but were still predominantly proliferative in type. The patient's course was progressively downhill. She soon developed tuberculous meningitis and died.

C. H. C., female, age 30, illustrates a combination of the foregoing types. Without a history of preceeding tuberculosis she became acutely ill following delivery with cough, fever and night sweats. Physical examination revealed minor changes over the right apex but a roentgenogram revealed a proliferative lesion extending to the second rib on the right side with a large area of exudate below the second rib (See Fig.4.). Under strict bed rest the exudative lesion below the second rib cleared completely with a prompt disappearance of all symptoms. The woman then resumed her normal life, being warned to maintain her weight at the proper level and to submit to periodic observations so that any change in the proliferative lesion in the apex might be detected. As expected, this lesion has shown practically no change even roentgenologically.

Observations on the University of California nurses over the past ten years has led us to believe that one of the chief factors in the development of tuberculous lesions is a pre-existing marked tissue hypersensitiveness.[6] Nurses, who have broken down and who at the same time have been shown to be highly sensitive before their breakdown, have developed typical exudative foci. Those only slightly sensitive have developed typical, fine, proliferative foci, appearing in one or both apices. Their subsequent courses under treatment have been essentially those outlined in the four cases described. It is important, however, to differentiate in this connection between first infection and re-infection types of tuberculosis, so well described by J. A. Myers.[7]

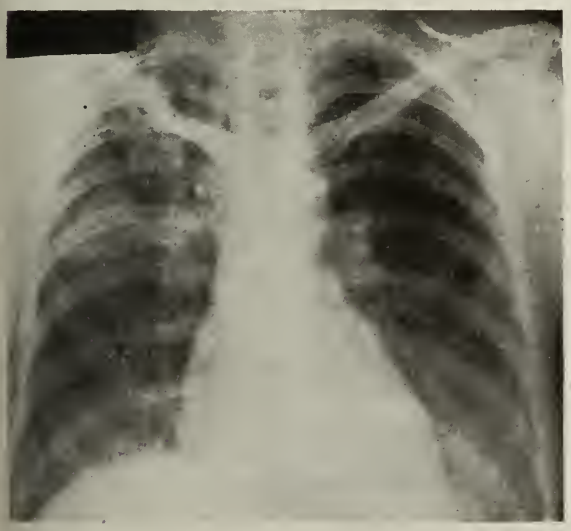


FIGURE 4

Predominantly proliferative and predominantly exudative lesion in a woman of thirty. The proliferative lesion involves the upper portion of the right upper. The exudative lesion is seen below it as a soft cloudy shadow, in marked contrast to the harder, stringy lesion above. The exudation occurred suddenly, following parturition and, with bed rest, cleared completely in six months. The apical lesion remains unchanged.

Regarding the usefulness of the above classification, the lesions in approximately 40 per cent of 120 cases were found to be predominantly exudative in character and of these roughly half of the patients were found suitable for compression therapy. This series includes patients treated at home as well as those cared for in small, private sanatoria and are felt to be representative of patients seen by the private physician in his routine practise.

There can be no doubt that the increase in general resistance brought about by rest, good food and fresh air will continue to be the deciding factor in the recovery of most patients with tuberculosis. In this respect our views have not changed for many years. They have definitely changed, however, in the stress placed upon the presence or absence of symptoms as the deciding factor in what treatment shall be employed. The intelligent anticipation of future intro-pulmonary changes, however, has certainly led to an improved technique in securing the best results with therapy and this can certainly be accomplished most effectively by close observation of roentgen changes. The failures in tuberculosis therapy today, aside from those regrettable failures which are the result of a low resistance quite outside our control, are due in the first place to a failure of early diagnosis and in the second place to a failure on the part of the physician to anticipate changes which may occur in the lung. The early recognition of cavity, for example, and the early employment of pneumothorax, even to the extent of treating ambulatory patients in this manner as outlined by J. A. Myers,[8] will prevent many an unfortunate outcome.

(1) The factor of increasing resistance remain paramount as a basis for therapy in pulmonary tuberculosis.

(2) The presence of cardinal symptoms, while

important, may not be solely used as a basis for intelligent therapy.

(3) Differentiation of exudative and proliferative lesions, largely by roentgenogram, is a distinct aid in estimating what character of therapy should be used in the individual case.

(4) Best results can be obtained by the intelligent anticipation of future intra-pulmonary changes with an attempt to accellerate or forestall them by rest in bed, artificial pneumothorax and the like.

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MODERN TRENDS IN TUBERCULOSIS AS THEY EFFECT THE GENERAL PRACTITIONER*

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I Introduction

IN THE midst of the very considerable discussion which is going on concerning the relative functions of the general practitioner and the specialist in the practice of medicine, the fact remains that in tuberculosis the main responsibility for its diagnosis, and to a considerable extent also for its treatment, rests upon the shoulders of the general practitioner.

The development of specialism in this as well as in other fields has been due, in part, to the fact that medical knowledge has increased so rapidly that it has become an impossibility for any one person to be fully cognizant of this knowledge in every field, and that consequently in particular fields individuals who specialize are able to bring to the service of their patients a higher degree of technical skill and a broader basis of general knowledge. The need for such specialism will probably always exist, but in the field of tuberculosis the gradual and insidious manner in which the disease usually manifests itself, and its varying forms, combine to bring the general practitioner in contact with the individual case earlier than would be possible in the case of the specialist, even were it desirable.

With this opportunity and responsibility placed upon him, it is becoming increasingly important that the general practitioner should make every effort to meet them adequately. That this is not always so at the present time is witnessed by the all too frequent experience of patients with definite tuberculosis consulting general practitioners not only once but often several times and over considerable periods before the correct diagnosis is made.

That this situation still exists in spite of the widespread general propaganda concerning the early diagnosis of tuberculosis is not only unfortunate in the results for the patients who thereby often lose their chance for recovery, but also in its effect upon the esteem in which the profession is held by the public at large, who are now very much more enlightened and consequently more critical of such mistakes.

This situation is all the more unfortunate because there seems to be no inherent reason why with the ordinary equipment and training of the general practitioner, much earlier diagnosis of tuberculosis should not be possible than is now usually attained.

This article is presented in the hope of pointing out to the general practitioner some of the fundamental concepts upon which our modern knowledge of tuberculosis rests, and the practical application of this knowledge as an aid to the practitioner in meeting this problem.

II Pathogenesis and Evolution of Tuberculosis

The Primary Complex—The tubercle bacillus enters the body usually by inhalation, less frequently by ingestion, and sets up a lesion either in the lung or the intestine, and secondarily in the regional lymph nodes, which combined organ and lymph node lesion is known as the primary complex. This primary infection takes place usually in childhood, but sometimes does not occur until adult life.

As a rule this infection and these lesions occur with few or no symptoms whatever, occasionally they are associated with a constitutional disturbance, and very occasionally may be quite acute. But usually, whether they start with or without symptoms the disease at the time remains localized in the primary complex, is largely absorbed, re-

*Prepared especially for The Journal-Lancet.

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mains latent throughout life, and in the majority of cases becomes largely calcified, so that, in the case of the lungs at least, it may be recognized by the X-ray.

Allergy—Any individual who has thus become infected, with or without symptoms, has a changed reaction to tubercular protein, which makes him sensitive to the administration of tuberculin and also changes his reaction to later secondary tuberculous infections which may occur during his life. This changed reaction due to the first infection is termed allergy.

This allergy is a specific reaction, in some way definitely related to immunological phenomena, but in no way represents immunity in the sense that the individual is afforded a protection against subsequent tuberculous infections. In fact, he becomes more sensitive in his reactions to tubercular protein, as shown by his positive tuberculin reaction.

This changed reaction which is called allergy does, however, definitely modify the reaction of the body to subsequent infections, because of the fact that the increased tissue reaction which occurs to subsequent infections tends to localize these secondary lesions and to prevent the general spread of the infection to other parts of the body. There have also been noted in the same individuals at different times very considerable variations in the allergy which exists, so that this tendency to localization may at times be lacking, allowing systemic dissemination, and in some cases may disappear altogether, so that the individual will again react to a subsequent infection just as he did originally to the primary infection.

Hematogenous Disseminations—Once the primary infection is established with the resulting primary complex, it is now recognized that at intervals during life this infection may not remain inactive and latent, but may from time to time discharge tubercle bacilli into the blood stream which may lodge in various organs of the body, particularly in the lungs, and there set up localized lesions. Such hematogenous reinfections usually take place from the primary lymph node lesion.

Looked at in this way, therefore, tuberculosis must be regarded as a general systemic disease, and its local manifestations in the lungs or elsewhere must always be thought of as a part of such systemic infection. The surgeon or the specialist in any field who recognizes a localized tuberculosis in any organ, as well as the internist, must recognize this fact and look for evidences of systemic tuberculosis of other organs at the same time as he is diagnosing and treating the particular localized lesion in which he may be primarily interested. If this were always done in the case of ischiorectal abscess, or of tuberculous joint, or a pleurisy with effusion, or any other of the numerous local manifestations of tuberculosis, many cases of tuberculosis of the lungs would be recognized much earlier than they are at present.

Tendency to Latency—It is important to recognize the fact that such hematogenous implantations in the various organs are often small and in themselves inconsequential, producing slight lesions and often only temporary symptoms, and that they have a great tendency to remain latent or to become obsolete. But it is also to be recognized that any such lesion may develop into active disease, which can only be prevented by its early recognition and proper precautions. Such active disease localized in any organ is spoken of as phthisis, using this term in the sense of localized organic disease in any organ, whether it be the lung or any other organ of the body.

The Evolution of Phthisis—This localized organic phthisis takes place because of reinfection either from the outside or from a pre-existing lesion in the body, and, as already indicated, this localization takes place largely because of the allergy which has been established.

When this secondary lesion which we call phthisis is established, there is definitely a lesser likelihood of hematogenous dissemination from it than from the primary lesions, in other words this phthisical lesion does not spread usually by the blood stream as do the early postprimary lesions.

The method of spread of phthisis, whether in the lungs or elsewhere, is almost always through the normal canal systems in the body, and this method of evolution of tuberculosis is called intracanalicular spread of the disease. In the case of the lungs it is bronchogenic spread, in other words it is by the aspiration of infectious material from an apical lesion to other parts of the same or the opposite lung that phthisis of the lung spreads and develops. It is by similar spread upward through the bronchi and trachea that the larynx becomes infected, and it is through the ingestion of infected sputum through the gastrointestinal canal that the intestines become infected in such a considerable number of cases of pulmonary phthisis. If the localized organic phthisis happens to be in the genitourinary tract, the spread is then through the genitourinary canal, from the kidney downward to the bladder

or other organs, or from the testicle or epididymis upward to the bladder and kidney.

The recognition of this fact that ordinary clinical tuberculosis which we call phthisis is the result of a secondary infection, either exogenous or endogenous, and that it takes on its particular localization because of the changed reaction called allergy, and that when it comes to spread it does so through the canalicular route, is important in the understanding of the very numerous manifestations of this systemic disease.

The Relative Importance of Endogenous and Exogenous Re-infection—Von Behring many years ago pointed out that childhood infection is often the seed of adult phthisis. In recent years, particularly in this country, there has been growing up an increasing emphasis upon the importance of adult exogenous reinfection, that is, the conception that pulmonary phthisis is usually a secondary infection due to contact exposure, and that such contact exposure is more important in the etiology of pulmonary phthisis than is the exacerbation of the childhood lesion.

More recent studies, however, have again tended to emphasize the importance of the activation of these latent childhood infections, and at the present time it would appear that the balance of evidence is in favor of a very considerable proportion of cases of adult phthisis being due to reinfection of the lung from these previous lesions which may have been latent for many years. Many competent observers believe that fully 70 per cent of the cases of adult phthisis are due to such endogenous reinfection.

In a recent survey carried out in Norway in a district of 35,150 inhabitants, Sindre Lunde was able to trace to its source the majority of the cases of pulmonary tuberculosis in that district. Of 261 such cases with known source of infection, 23 per cent developed directly from the primary infection, 15 per cent appeared to be due to exogenous reinfection, and 59 per cent in the form of endogenous reinfection. Thus, in more than four-fifths of the cases the primary infection either directly or indirectly was responsible for the later dissemination, and in almost two-thirds of the cases the reopening of and metastatization from the old and incompletely healed lesion was the cause of the later pulmonary disease. This survey is one of the most thorough studies with which I am familiar, and has considerable significance.

In my opinion, at least 40 per cent of our cases of adult phthisis occur from endogenous reinfection, and this estimate is probably too low.

III Practical Implications

It has seemed desirable to go into this somewhat theoretical discussion of the basis of our knowledge of tuberculosis in order that we may intelligently apply the principles involved to the practical problems of everyday practice. Some of these implications appear to be as follows:

(1) It is of utmost importance to prevent massive infection and reinfection. The dosage in such infection appears to be the determining factor in the extent and the severity of the resulting disease, and it would appear that this is particularly important during childhood.

Practically, this means that children and young adults should be protected from repeated massive infection with every possible precaution, and that on the other hand incidental small infections probably are unavoidable under conditions of modern life and are fortunately of less moment.

(2) The theory of endogenous reinfection from early latent lesions would make the early detection of such latent lesions extremely important. Practically, this can be done by systematic examination of groups of individuals often apparently healthy, and particularly those who have been in known contact with the disease. Such recognition is particularly important in children, and is practicable with the systematic use of the X-ray and the tuberculin test.

(3) After such early lesions are detected, subsequent hematogenous metastases may frequently be guarded against by providing a protective environment for the individual. This means particularly more rest than usual for such a child, less active exercise, particular attention to nutrition, especially to adequate proportion of vitamins in the diet, and in general regular systematic supervision and repeated examination to detect the earliest manifestations of active disease.

While unfortunately such indirect methods are inadequate, nevertheless in many cases they are effective.

(4) It is obvious that the early diagnosis of pulmonary phthisis is particularly important, whether this appears to be due to secondary lesions from without or from within the body. The diagnosis that such secondary active disease has occurred should be reached at the earliest possible opportunity if adequate and successful treatment is to be instituted.

This means on the part of the practitioner that he must recognize the fact that tuberculosis is one of the most common organic diseases with which he will come in contact, that its manifestations are very insidious, that the periods of lat-

ency are very deceptive, and that the physician can only hope for better and earlier diagnosis if he is continually on the watch for this disease.

As a practical guide it would be more helpful if less dependence were placed upon the physical signs of the chest and more on the constitutional symptoms and the clinical history, recognizing the fact that tuberculosis manifests itself in so many different ways and that the same disease, though present, may not be continuous in its course, and that often there is a wide separation both in time and in the site of localization of the lesions.

Also, that in many cases in which suspicion is directed toward the lung, the X-ray examination will often afford more valuable information than even the most painstaking physical examination. This should not be interpreted as a suggestion to neglect careful physical examination, but as a warning that alone it is often insufficient.

(5) The appreciation of tuberculosis as a systemic infection should lead to the thorough investigation of other organs, especially the lungs, when tuberculosis is discovered in any other portion of the body.

(6) Having made the diagnosis of pulmonary phthisis as early as is feasible, the question of proper treatment is of great importance. Without going into the details of modern treatment it will be sufficient to emphasize the fact that the fundamental basis of proper treatment of tuberculosis is rest, that all other factors are of secondary importance, that any case of active tuberculosis needs absolute bed rest, and that such rest should be continued over a very long period of time after the active symptoms have subsided.

Also it must be recognized that our modern collapse therapy of pulmonary tuberculosis has been gradually working a revolution in our treatment of this disease, and that by the aid of artificial pneumothorax and, if necessary, more radical surgical treatment, many cases that were previously doomed to death or chronic invalidism are now saved. It is a general experience of institutions for treatment of cases of pulmonary tuberculosis, that about 40 per cent of the cases of tuberculosis are suitable for this type of modern treatment, and the possibility of its use should be considered in every case.

This collapse therapy not only shortens and makes more effective the course of treatment for the original phthisical lesion, but also markedly diminishes the chances of extension of the disease by intracanalicular spread.

The spectacular results that have been obtained by these modern methods of treatment have had another very important effect, in modifying our ideas about change of climate or even open air life *per se*. These agents, important as they are, would appear now to have secondary importance as compared with rest and localized collapse treatment.

(7) The proper appreciation of the frequency of primary infection and the latency of tuberculous lesions would lead to the recognition of the fact that in many cases in which such latent lesions can be recognized by modern methods, no radical or prolonged treatment is necessary. It is quite as unfair and unscientific to subject patients who do not need long treatment to such treatment as it is to fail to recognize active cases who are in need of such treatment.

It is obvious that a positive tuberculin reaction does not mean active tuberculosis. It is also equally obvious that calcareous deposits in the lung, easily recognized by X-ray, do not necessarily need treatment. As considerable injustice has been done to this class of cases in the past, the importance of recognition of this phase of the problem by the general practitioner is considerable.

IV The Role of the General Practitioner

To the physician who has been interested to follow the above line of argument it is obvious that the better recognition and treatment of tuberculosis does not call for any specialized degree of technical skill but is rather dependent upon the alertness and intelligence of the general practitioner who in the main will be called upon to see these cases sooner than can be expected by any specialist. It is hardly too much to say that in this field of practice the general profession is more or less on the defensive, because of the criticism of an aroused and enlightened public.

There would appear to be no adequate explanation for this situation excepting that either in training or in practice the medical profession has failed to a considerable degree in meeting its obligations. The specialist will always have a certain field of usefulness, but it is to the general practitioner that we must look for the ultimate solution of the medical phases of the tuberculosis problem.

THE TREATMENT OF ADVANCED PULMONARY TUBERCULOSIS*

LEWIS J. MOORMAN, M.D.
OKLAHOMA CITY, OKLA.

OUT OF the dead language of a great people comes the facinating story of a living science. Though many vital truths, finding their origin in this marvelous period of Greek history, were only vaguely conceived, some were outstanding in the clarity of their conception. Among these may be cited the Greek physician's comprehensive understanding of certain phases of pulmonary tuberculosis. As early as the fifth century Before Christ, we find Hippocrates quoted as follows; "The most dangerous disease, and the one that proved fatal to the greatest number, was consumption." And again as having said: "The spitting of pus follows the spitting of blood, consumption follows the spitting of this and death follows consumption."

In the first century Before Christ, Aritaeus presented a description of advanced tuberculosis not surpassed in two thousand succeeding years. Time and space will permit only a few lines from this graphic picture: "Nose sharp, slender; cheeks prominent and red; eyes hollow, brilliant and glittering; swollen, pale or livid is the countenance; the slender parts of the jaws rest on the teeth, as if smiling, otherwise of a cadaverous aspect. So also, in all other respects, slender without flesh; the muscles of the arms imperceptible; not a vestige of the mammae; the nipples only to be seen; one may not only count the ribs themselves, but easily trace them to their terminations....If in these cases disorder of the bowels supervenes, they are in a hopeless state."

One cannot follow Aritaeus without being impressed with his knowledge of therapeutic values. Note the wisdom expressed in the following statement: "The affliction of chronic disease is very great; there is a long time of emaciation and the cure is uncertain. For either such diseases cannot be entirely got rid of, or, on account of a slight mistake, they return. Those who suffer from them, moreover, do not keep up the treatment to the end, or if they do continue it, they break loose from the long rational mode of living which has been laid down for them."

The infectious nature of tuberculosis was obviously recognized. We find Galen, the last of the epoch making Greek physicians, urgently warning against the danger of contact.

Such a clinical picture as that drawn by Aritaeus constitutes a serious indictment against the present day physician. With rare exceptions, the physician should look upon advanced pulmonary tuberculosis as a reflection upon his community. When he sits at the bedside of such a case and beholds the mummied crucible where the last spark of life bravely contends with the insidious approach of death, he knows someone is to blame for the patient's miserable plight.

However, not every case of advanced tuberculosis is chargeable to the doctor. Often the sufferer fails to seek medical advice until the disease is far advanced; not infrequently patients willfully ignore the doctor's warning, and occasionally pulmonary tuberculosis is acute in onset and rapidly progressive in spite of treatment. However, it must never be forgotten that, either directly or indirectly, the doctor may be responsible. Whether his sins be those of omission or commission, they are usually the result of carelessness rather than want of knowledge.

When symptoms and signs became obvious, even Hippocrates, with all his limitations, knew that consumption might follow. Today, because of great therapeutic advances, the recognition of symptoms and signs in a given case places upon the attending physician a responsibility out of all proportion to that which confronted Hippocrates in his time. The family physician must hasten the day when every case of pulmonary tuberculosis will have the advantage of carefully applied present-day pulmonary therapeutics in successive steps as necessary to effect the maximum benefit.

For many years, rest has been the dominant therapeutic agent in the management of pulmonary tuberculosis. Increasing knowledge of the disease resulting from diagnosis and therapeutic advances, not only leaves rest preeminent among the accepted therapeutic measures, but broadens and elevates the pedestal upon which it stands. In addition to prescribed bed rest which lessens the rate and depth of respiration, it has been observed that nature, through muscle tension and fibrotic contraction of diseased areas, seeks to bring about additional rest at the site of the lesion. In the more advanced cases, careful observers have noticed that these restraining and contractile forces bring about a noticeable retraction of the chest wall and a shifting of the mediastinal structures toward the diseased side, with a corresponding rise of the diaphragm. It is possible to demonstrate these changes by physical examination and by X-ray studies.

As is well known, healing may take place in

*Prepared especially for THE JOURNAL-LANCET.

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favorable cases without demonstrable changes in the size and conformation of the thorax, and without changes in the position of the mediastinal structures and the diaphragm. It is also well known that many less favorable cases heal only through the saving influence of these changes. In a certain number of cases it is equally obvious that bed rest, plus all the restraining influences of nature, fail to bring about satisfactory results. In such cases we often find that there has been a destruction of tissue with cavity formation, obviously indicating that nature, unaided, cannot, in every case, bring about adequate local rest and the physiological changes necessary to check the progress of disease.

The careful observation of these phenomena by sagacious clinicians has resulted in our well-known present-day collapse therapy. The term "collapse therapy," embraces all the surgical measures designed to bring about collapse, limitation of function and relaxation in a diseased lung area. The measures, skillfully employed in well chosen cases, have proven to be a great boon, especially to those suffering from the more advanced and recalcitrant forms of disease. Collapse therapy offers prompt relief from many distressing symptoms, including rapid reduction in cough and sputum. Of equal importance is the added protection it brings to those in contact with the case. The closure of cavities and the healing of diseased areas are definitely hastened, and in many cases the sputum becomes negative soon after collapse therapy is instituted. Often, in otherwise hopeless cases, the disease may be arrested and earning capacity restored.

In this discussion we shall consider the following surgical measures: (1) Artificial pneumothorax; (2) intrapleural pneumolysis; (3) phrenicectomy, and (4) thoracoplasty.

Since the main object in employing any one of these measures is to secure collapse of the lung with the resulting physiological changes, it is easy to see that under certain conditions a combination of two or more of the above surgical procedures may be necessary in order to obtain satisfactory results.

Artificial Pneumothorax — Artificial pneumothorax, the first to be employed, is still the method of choice. This is true because of the simplicity of its technique and because it is the only effective step toward collapse that can be readily retraced or altered in degree from time to time, according to the judgment of the operator. Artificial pneumothorax should be considered in the treatment of any case of pulmonary tuberculosis not responding, after a reasonable time, to routine rest, hygienic and dietetic treatment. This is true regardless of the question of unilateral or bilateral involvement. If the case is a bilateral one, and the lung showing the greater amount of involvement is collapsed, the contralateral lung may show improvement as pneumothorax progresses. If this does not follow, or if the disease in the contralateral lung becomes more active and progressive, simultaneous bilateral pneumothorax may be indicated. Artificial pneumothorax is occasionally indicated as a means of controlling pulmonary hemorrhage.

Intrapleural Pneumolysis—In case it is found impossible to secure satisfactory collapse because of adhesions, intrapleural pneumolysis should be considered. If adhesions are not too extensive, and if it can be determined that the adhesive bands do not contain lung tissue or large blood vessels, it is safe to employ the cautery with a view of severing the adhesions, thus releasing the tension on the lung and permitting more satisfactory collapse. In this way it is often possible to bring about the closure of large cavities and to favor healing by placing the surrounding diseased lung tissue at rest.

Phrenicectomy—Removal of the phrenic nerve is indicated in cases where artificial pneumothorax is impossible because of extensive adhesions, or where partial or incomplete artificial pneumothorax has failed because of adhesions not suitable for cauterization. Often the elevation and fixation of the diaphragm, resulting from phrenicectomy, will be sufficient to effect the desired results. This is particularly true in cases where phrenicectomy is employed as an adjunct to artificial pneumothorax. Phrenicectomy is also indicated as a preliminary step in some cases requiring thoracoplasty. We have been surprised to find that phrenicectomy, in some cases slated for thoracoplasty, has resulted in such marked improvement the latter was deemed unnecessary. In any event, it is usually safe to assume that phrenicectomy will place the patient in better condition for major surgery and prove a valuable adjunct in ultimately bringing about the desired results. Phrenicectomy is particularly indicated in basal lesions, however, a note of conservatism should be sounded because of recent observations which show that the paralyzed diaphragm may undergo serious muscular atrophy with troublesome digestive disturbances; even duodenal ileus has been reported in a few cases.

Thoracoplasty—If the above surgical procedures, employed alone, or in combination, fail to bring about satisfactory collapse, thoracoplasty may be successfully employed. For the benefit of

those who may question the advisability of such a radical procedure, may I say it is surprising how well tuberculous patients tolerate major surgery, especially if the patients are wisely chosen and if surgery is skillfully applied, with careful attention to anesthesia and the condition of the heart muscle.

Other surgical measures occasionally employed independently, but more often as supplementary to the above, are: scaleniotomy, extrapleural pneumolysis, crushing of the phrenic nerve, and intercostal neurectomy.

There is probably no combined medical and surgical problem so dependent upon the careful cooperation of clinician and surgeon as is the treatment of advanced pulmonary tuberculosis. This is particularly true when major surgical procedures are under consideration. The clinician is charged with the heavy responsibility of a careful study of each case to determine the patient's general condition, the relative age, character and extent of lesions in the two lungs, and the condition of the heart muscle. Having formulated an opinion as to these factors, he must estimate the probable effect of surgery and attempt to arrive at a decision as to the type of operation and the approximate site and extent of the same. This implies the necessity of continued observation, preferably in an institution for the treatment of tuberculosis; of repeated physical and X-ray examinations; also ability to place proper diagnostic interpretation upon the varied pathological manifestations, and to exercise that discriminating judgment which comes only through experience. Such a searching and comprehensive study constitutes the clinician's obligation to the patient and the surgeon, a debt which must be paid before the latter can conscientiously proceed. This is not a reflection upon the surgeon, but merely an attempt to place responsibility where it belongs. After a thorough clinical study, such as that mentioned above, a consultation between clinician and surgeon should result in the best possible therapeutic program. Dr. Evarts A. Graham has said, "Any surgical procedure, even the simplest on any part of the body, to be effective, to be successful, to be free from danger, and to get the best results, requires judgment which is acquired only by experience." This is particularly true of thoracic surgery.

Even though the surgeon may possess unusual knowledge of the disease, and though he may be endowed with a sympathetic grasp of the tuberculosis problem, the operation is still only an important incident in the course of treatment. It is not a cure, but merely a therapeutic aid which should be sandwiched between long periods of routine management. Though the surgeon may consider the operation the meat of the sandwich, the clinician may confidently claim that the sustaining periods of routine management constitute the "bread of life." Obviously the responsibility is not lifted from the shoulders of the clinician when the case comes to surgery.

In closing, we return to Hippocrates: "The spitting of pus follows the spitting of blood, consumption follows the spitting of this, and death follows consumption." This fleet fatalistic crescendo calls the family physician to arms. With a sharpened sense of responsibility, he should weigh the evidence in each case, ever keeping in mind the fact that symtoms of pulmonary tuberculosis mean pathology, even though it may be minimal; that progressive symptoms and physical signs, *unchecked,* mean ultimate gross pathology; that "consumption follows this and death follows consumption." Special emphasis should be placed upon the word *unchecked.* If, after a reasonable period of faithful routine management, the disease is obviously progressive or stationary, or if there is doubt as to the progress made, the patient should be urged to consider admission to an institution where adequate additional diagnostic and therapeutic agencies are available, and where harmonious and intelligent medical and surgical team work may be expected.

Under such a plan, the attending physician should be able to make a valuable contribution to the final diagnostic appraisal and the determination of a therapeutic program. At the same time, his co-operation in such a course can only result in the acquisition of valuable knowledge. Prompt action in such cases should mean a better chance for the patient and an easy conscience for the attending physician.

The
JOURNAL LANCET

Represents the Medical Profession of
MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA

The Official Journal of the

North Dakota State Medical Association
South Dakota State Medical Association
The Hennepin County Medical Society
The Minnesota Academy of Medicine
The Soo Railway Surgical Association
The Sioux Valley Medical Association
North Dakota State Health Officers' Assn.
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M. E. Herz, *Business Manager*
W. L. Klein, 1851-1931
84 South Tenth Street, Minneapolis, Minnesota

MINNEAPOLIS, MINN., APRIL 1, 1934

TUBERCULOSIS ROBS YOU—PUBLIC HEALTH PROTECTS YOU

The National Tuberculosis Association has selected the above title as the slogan for its Spring Education Campaign of 1934. Since 1928 this Association has presented an annual educational campaign, laying special stress on early diagnosis and treatment. Each campaign has stimulated great interest and activity in tuberculosis control among the nursing and medical professions, other closely allied groups, and the general public. That this interest has greatly hastened the day of our final reckoning with the tuberculosis problem is undisputable. One billion dollars is the estimated annual cost of tuberculosis to this country. During the World War about three million men and women served in war activities. Among this number enough have developed clinical tuberculosis so that compensation for them alone cost the country forty-six million dollars in 1932.

Approximately a century ago, the mortality from tuberculosis in this country was nearly 450 annually for every 100,000 persons living. Today it is approximately 63 per 100,000 of population. Obviously, the public health measures, which include all the work done by medical, nursing, veterinary, and similar groups, has done much to protect us, but still we lose approximately 85,000 lives each year from tuberculosis.

Public health has not been exploited to its fullest extent by any means. Pasteur expressed the opinion that it is within the power of man to rid the human family of all communicable disease. To date, public health measures have laid low such communicable diseases as diphtheria, typhoid fever, and smallpox. Tuberculosis is next in line, for the basic and essential facts about the eradication of tuberculosis from man and his domestic animals are known.

This special issue of THE JOURNAL-LANCET, as well as a similar issue to appear May 1, is an attempt to aid the National Tuberculosis Association in its Spring Education Campaign by bringing to physicians of the Northwest articles written by authorities on tuberculosis and other closely related diseases from various parts of the country. In these articles there will appear slight diversity of opinion which, for the most part, is due to the fact that the tuberculosis situation is not the same in all parts of the country. For example, in one part tuberculosis is still a very prevalent disease, very little has been done to combat it, hospital facilities are inadequate; while in another part tuberculosis is no longer prevalent, much has been done to combat it, hospital facilities have been adequately provided, and in some places there are now more sanatorium beds than necessary. Obviously, tuberculosis viewpoints of physicians from such parts will differ considerably.

Each contributor to these two special issues of

THE JOURNAL-LANCET is an authority in his field. I am sure that every reader of THE JOURNAL-LANCET will join the members of the Editorial Board in thanking most heartily all of these authors for giving so freely of their time and experience in the preparation of these articles, which will stimulate, encourage, and instruct us in the diagnosis, treatment, and prevention of a very destructive disease.

J. A. M.

ANNUAL MEETINGS IN THE DAKOTAS

The medical associations of South and North Dakota will have their annual meetings in May in the order here mentioned with an interval of twelve days between sessions.

The physicians of South Dakota are to be congratulated on the quality of the program arranged for their meeting to be held in Mitchell, May 14-15-16, 1934. From a scientific point the clinics are well balanced and material that is met in every day general practice will be presented. Diseases of the skin, liver, gastro-intestinal tract and children, as well as cancer, osteomyelitis and problems of roentgenology and pathology will be presented. The men giving these clinics are leaders in the Northwest. The clinical material will be plentiful and the meeting should serve as a valuable post-graduate course for the general practitioner. Medical economics, which is such an important subject in these days of reconstruction will also be discussed by a leader in this field of thought.

The North Dakota association will convene at Fargo at 9 a. m. Monday, May 8, and a very interesting tentative program has been announced Papers on medical and surgical subjects will be interspersed by clinics presided over by both local and extra-state talent. The business of the session will be disposed of by the house of delegates and councillors on a previous day thus giving these deserving and faithful members an opportunity to enjoy and participate in the scientific program. The program committee has certainly arranged a varied, practical and instructive list of subjects to serve to the members who may attend, and the speakers are also well chosen. How anyone can resist partaking of the feast, we cannot understand.

A. E. H.

USEFUL RECREATION

Neuromuscular skill, acquired during the leisure hours of youth, has often been an important determining factor in adolescence.

Those who learn to "play the game" soon realize that they must "give and take," that they must reason from cause to effect and co-ordinate their activities according to circumstances encountered.

Huxley said, "The whole of life is an adjustment, a continuous adjustment of internal to external relations" and where, pray tell, can such training be had to better advantage than on the athletic field?

We would not go so far as to agree with the contention that athletes never go to prison, but certain we are that because of their training, they lead more orderly lives and fit themselves better to conform to the rules of social requirements.

A. E. H.

Proceedings Minnesota Academy of Medicine

MEETING OF FEBRUARY 14, 1934

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, February 14, 1934. Dinner was served at 7 o'clock, and the meeting called to order at 8 o'clock by the President, Dr. A. E. Wilcox.

There were 51 members and one visitor present.

Minutes of the January meeting were read and approved.

The scientific program was as follows:

DISSEMINATED LUPUS ERYTHEMATOSUS

by

PAUL A. O'LEARY, M.D.
Rochester, Minn.

Dr. O'Leary read his Thesis on the above subject, and several lantern slides of cases were shown.

Abstract

Disseminated lupus erythematosus is of two types, namely, acute and subacute. The acute type is frequently a rapidly progressive disease, the life expectancy in such cases being a year or less; while the subacute type runs a milder, slower course, is characterized by remissions in both the constitutional and cutaneous symptoms, and has a mortality rate of approximately 30 per cent. Both diseases are characterised by protracted illness, marked constitutional symptoms, and are frequently ushered in by symptoms indicating a toxic process. Both forms of the disseminated type may appear as a result of dissemination of a localized lupus erythematosus or may start primarily as a disseminated form of the disease.

A group of forty-seven cases is studied, and autopsies on ten of the acute type are reviewed, particularly for evidence of tuberculosis. The findings show a comparatively low incidence of tuberculosis, suggesting that tuberculosis is not

a factor in the cause of death in patients with disseminated lupus erythematosus.

Discussion

Dr. C. D. Freeman (St. Paul): To dermatologists, the simplest thing about lupus erythematosus is the diagnosis. It is only occasionally that we are unable to recognize this condition.

When we come to etiology it is different. In general I agree with what Dr. O'Leary has said. I received recently a reprint from Dr. Otto Kren, of Vienna, whom many of us know and respect very much. Kren emphasizes blood cultures and claims that lupus erythematosus is due 100 per cent to tuberculosis. He takes bi-monthy examinations over a period of many months. He stresses the importance of many examinations; in from one to three examinations his results are from 20 to 57 pre cent positive, and in from four to ten examinations they are 100 per cent positive. I would like to know if Dr. O'Leary has done any of this work over long periods. This seems to be the essential factor, according to Kren and Lowenstein. One negative examination means nothing to them. This was not my conception of the disease, although tuberculosis must always be taken into consideration. Kren's and Lowenstein's findings have not been verified by other workers along this line.

As far as therapy is concerned. it is rather unsatisfactory. I had one case of the discoid type, rather inactive, superficial or so-called non-scarring type, in which I gave 25 mg. of gold sodium thiosulphate, and the patient promptly developed the disseminated variety and with an almost serious outcome. I also know of one other similar case in the Twin Cities. Regardless of the fact that gold is one of our best therapeutic agents for this disease when properly administered, there is always a possibility of a reaction. And a therapy which one cannot use in all types of a disease, as for instance in syphilis, strikes me as though we are not exactly on the right track.

An argument against tuberculosis as a causative factor is that sunlight is contraindicated in lupus erythematosus, while in most other tuberculous conditions sunlight is beneficial when proper exposures are made. Dr. Butler had a patient in whom long exposure to sunlight precipitated a very active lupus erythematosus on the exposed areas. She had never had any trouble previous to that time. As I recall, the termination was fatal in a few months.

As stated above, the diagnosis is comparatively easy, the etiology still in doubt, and the therapy, although at times giving striking results, is unsatisfactory.

I enjoyed Dr. O'Leary's paper and slides very much. He covered the field without any exaggerations or false claims and those interested should have a good idea of the present status of lupus erythematosus.

Dr. J. M. Armstrong (St. Paul): I would like to report a case of acute disseminated lupus erythematosus that recovered. The case is unique. But I wish first to make a few remarks about acute disseminated lupus erythematosus as I have seen it. In the first place, it seems to me that in every case I have seen there is a rather peculiar mental picture—a dread of something impending. I have seen seven cases and five of these died of pulmonary edema; I suppose it might have been pneumonia but it was pretty rapid.

The patient I mentioned was a married woman 27 years of age, whom I saw September 24, 1928. At that time she had an acute disseminated lupus erythematosus. She stated that it began on the right side of the nose on the 17th of the preceeding August. When I saw her there were lesions on the nose, cheeks, ears, backs of the fingers, and also some lesions on the forearm. She said it had spread to the fingers and back of her ears inside of two weeks. There were also lesions about the genitals, and it appeared there before it appeared on the chest. There is a reason for that. At the time she consulted me on September 24th, she had a baby seven and a half months old and she was six and a half months pregnant, so she became pregnant on the first ovulation after her baby was born. She had been living in California and got into the hands of some irregular practitioners. She was told she must see a pediatrician after her baby was born and he immediately told her she was not to nurse the baby, although she told me she had plenty of milk. Two weeks after her confinement she was passed on to a surgeon who said she needed a cervical repair. She was then told she had tuberculosis. At the time this eruption appeared on her face she went back to the same doctors and was told she had ringworm. That did not clear up fast enough and she was passed on to another who told her she had gonorrhea and syphilis.

I saw her on September 24th and by the 10th of October these lesions had spread over the entire body and were confluent on the body, arms and lower limbs. Edema was beginning to be noticeable on the entire body. On the 12th she was sent to the hospital. X-rays of the chest revealed nothing. The urine was negative. She never had very much temperature, 102° being

the highest. As a matter of fact, she felt very comfortable. There was no itching but she described the feeling of the skin as one of formication. Her mentality was perfectly clear. On the 12th there commenced to be some crepitus and rales in the lungs and we informed the husband that we did not think she could go on to term. On the morning of the 18th her condition became so bad that a bag was inserted in the cervix and the child was born at 2:30. Within 24 hours after the uteros was emptied all the edema of the skin cleared up and the lesions began to disappear, and by the 6th of November every vestige of the eruption was gone. There was some telangiectasia on the inside of the thighs but this may have been there before. She became absolutely well and eight months afterward consulted another physician who removed her tonsils. I did not see her again but met her husband a year afterward and he said she was entirely well.

Of course, this does not throw any light on the etiology.

Dr. S. E. Sweitzer (Minneapolis): I would like to congratulate Dr. O'Leary on this very fine paper. It emphasizes the fact that we know very little about acute lupus erythematosus. I just want to state, in regard to Dr. Freeman's question, that we have done some work on the etiology of acute lupus erythematosus as regards tuberculosus; Dr. Laymon made a number of blood cultures on lupus erythematosus and on acute tuberculosis cases, and his findings were negative. Dr. Laymon's cases have been published. We could not discover the findings which Dr. Kren reports, and I think others have had similar experience. Personally, I don't think acute lupus erythematosus has anything to do with tuberculosis. As far as my conception of this disease goes, we do not know anything about the etiology. We assume that discoid lupus erythematosus can be caused by tuberculosis, and they may go along for years, then become acute. I had one patient with discoid lupus erythematosus who had some bad teeth, and sent the patient to the dental department at the hospital with the request to pull one tooth at a time. But they pulled a number of them at once. The patient immediately developed acute lupus erythematosus, with a very exudative eruption of the face, body and extremities. She developed symptoms of pulmonary involvement and promptly died. We were unable to get an autopsy on that case but we have on others. I think when they get acute lupus erythematosus they promptly die within a very few months. This type sometimes occurs after the chronic discoid type has existed for years.

Dr. F. R. Wright (Minneapolis): Two things have come up in this discussion which are particularly interesting to me. Dr. Armstrong reports a case of lupus erythematosus which immediately got well when the pregnancy was terminated. Dr. O'Leary reported the case of a woman whose lupus erythematosus became worse when she became pregnant. There is a certain type of toxemia which may accompany pregnancy. Now the question is, in Dr. O'Leary's case, was this a normal pregnancy or was it producing a toxemia? And in Dr. Armstrong's case, was this producing a toxemia which was relieved as soon as the pregnancy was terminated? It is true in this country that we advise against pregnancy for a young married woman who has incipient tuberculosis because it may aggravate her condition. But in Germany, where they are fairly careful, they encourage the tuberculous woman to become pregnant because there is never a time in a woman's life when her nutrition is so high as when she is pregnant.

Dr. F. C. Rodda (Minneapolis): The reaction of different individuals to infections and body insults varies widely. For instance, a dose of medicine, an exposure to sunshine, an infection, may produce radically different results in different individuals. Some of these reactions we know to be due to allergy. In comparing the chronic with the acutely fatal form of lupus erythematosus, I wonder how large a role allergic manifestations play in the latter type?

Dr. John Butler (Minneapolis): I was much pleased to hear this excellent presentation by Dr. O'Leary. I think the diagnosis of this rare disease is important to many of the members present. Some years ago, in looking over the literature on erythema multiforme, I found a report by Osler (1905) in which he had described thirteen cases of erythema multiforme with skin and visceral manifestations. He considered these cases carefully, and, on account of the variable character of the lesions, placed them in the erythema multiforme group. Three of these patients died. We know that erythema multiforme is a skin disease with little or no systemic disturbance. Patients do not die of this disease. It is quite possible that the fatal cases described by Osler were examples of acute disseminated lupus erythematosus. Typhoid fever may have been confused with the same disease.

Another condition which I don't remember that Dr. O'Leary mentioned is kaposi's erysipelas perstans facei, which is considered a variant of disseminated lupus erythematosus. Dr. Sweitzer had such a case at the University Hospital some

years ago. The disease simulated, in many respects, a severe erysipelas of the face and scalp, with high fever. The scalp hair came out. The casual observer would probably have diagnosed it as a case of erysipelas. Later erythematous plakues developed in the upper and lower extremities and the patient died of a disseminated lupus erythematosus. Another exciting factor in this disease is photosensitivity; there are a number of cases reported where the disease developed following a severe sunburn. I had such a case, which was also observed by Drs. Freeman, Sweitzer and Michelson. The patient was a girl 26 years of age. Four weeks after the sunburn she developed discoid patches over the bridge of the nose and cheeks. I considered it lupus erythematosus of the chronic discoid variety. The patient was not apprehensive and felt well at that time. A few weeks later there developed erythematous patches on the extremities; she began running a temperature and died in two months' time of a disseminated lupus erythematosus. The necropsy showed no signs of active or healed tuberculosis. The lymph glands were carefully studied. While earlier blood cultures were negative, the terminal infection was that of a streptococcic septicemia.

Twenty-five years ago the Austrian and German schools favored a tuberculous etiology in this disease. I am surprised to learn that Dr. Kren considers it 100 per cent due to the tubercle bacillus. The recent literature of the French, English, and American is fast getting away from a tuberculous etiology in this disease. I venture to say, if you take many fatal skin diseases of unknown cause, such as pemphigus, mycosis fungoides, lymphogranulomatosis cutis, etc., that the necropsy findings will show no greater or less incidence of active or healed tuberculosis than is found in disseminated lupus erythematosus.

Dr. H. E. Michelson (Minneapolis): Dr. O'Leary has illustrated and defined for you in a beautiful manner the syndrome that we call acute disseminated lupus erythematosus. This condition, no doubt, is a constitutional disease with skin manifestations. One might take up every system of organs in the body and enumerate the symptoms of this disease which are encountered. For example, there are ocular symptoms, nervous symptoms and kidney symptoms; and, in fact, there is practically no portion of the body that might not be involved. The etiological factors have not been discovered with certainty. The two leading views are, first, that this condition is a form of sepsis; and the second is based on an assumption that there is a tuberculous septicemia. To me, it appears that the disease is of multiple etiology and that probably any number of various factors can evoke the syndrome. It seems certain that the patient must be the proper type for such an outburst, as is evidenced by the fact that some mild cases of lupus erythematosus can be suddenly changed into very severe ones by some almost negligible factor, such as exposure to sunlight, while other patients with severe localized lupus erythematosus may have every manner of treatment and physical abuse and still have no dissemination. The liver may play an important part. Certainly, there is no known pathology or specific treatment. However, early recognition most certainly saves the patient from treatments which definitely hasten the termination.

Dr. A. E. Smith (Minneapolis): I would like to ask if the diurnal temperature range has been studied in these cases. In tuberculosis of the eye, I studied the diurnal temperatures and found subnormal morning temperature and very decided diurnal range in all those cases that had a tuberculous etiology.

Dr. O'Leary (in closing): Dr. Michelson has answered the question which Dr. Freeman asked in regard to Kren. The fact that Kren is able to obtain 100 per cent positive evidence of tuberculosis in lupus erythematosus, while other workers, using the same methods, have obtained negative results is a severe criticism of his work. It is impossible to interpret such discrepancies without more data on Kren's technic. Likewise, the low incidence of tuberculosis in the autopsied cases reported in this country is against Kren's work.

I would classify Dr. Armstrong's case as of the subacute type of lupus erythematosus disseminatus. There has been a mortality of 100 per cent in the acute types of disseminated lupus erythematosus in my group of cases, while in the subacute types one-third of the cases have apparently been cured; another third are in remission, and the remaining one-third have died.

The question of allergy raised by Dr. Rodda is the most vital point brought out in the discussion. We have been undertaking cultural studies for the past few years but have not reached a point where we have much to talk about. The cultural studies indicate quite definitely that the disease is an infectious one and the causative organism probably plays the role of an allergen in the production of the syndrome of disseminated lupus erythematosus.

Apropos of Dr. Butler's remarks, I endeavor to avoid the use of the numerous terms, many of which are purely descriptive, which have been recommended for unusual types of this disease.

I have felt that the types of lupus erythematosus which have a bizarre aspect should not be given a new name.

Dr. Michelson has summed up the situation very well by saying that lupus erythematosus is a constitutional disease of which the dermatological phases are a small part, and our therapeutic efforts must be directed toward the systemic manifestations rather than the cutaneous lesions.

SINUSITIS AND ASTHMA

by

CHARLES E. CONNOR, M.D.
St. Paul

Abstract

1. Either allergy or infection or both of them may be responsible for nasal hyperplasia.

2. Every effort should be made to recognize the presence of an evaluate the relative importance of these two factors.

3. No case of asthma should be submitted to surgery until every effort has been made to eliminate or control all allergic factors.

4. Suppurative lesions in the nose and accessory sinuses of asthmatics should be dealt with on the indications ordinarily recognized in non-asthmatics.

5. The removal of non-suppurative foci of infection from the nose and accessory sinuses in intrinsic asthma will usually result in marked and fairly permanent improvement, but not cure, in their local manifestations, obstruction, discharge and acute head infections, and in improvement or cessation of the asthma which, however, is not permanent, the period of freedom from attacks lasting from one to several months, the average being four to six. Operation should not be offered in such type of case as a cure for asthma.

6. Non-suppurative foci of infection in the nose or accessory sinuses in intrinsic asthma may occasionally be treated surgically in selected cases in an effort to indirectly affect the asthma by improving the general condition of the patient, by lessening the tendency to involvement of the lower tracheo-bronchial tree, or by removing local conditions which predispose to the so-called "trigger attacks" of acute head infection and consequent asthma.

DISCUSSION

DR. E. J. HUENEKENS (Minneapolis): I can commend unreservedly the standpoint Dr. Connor has taken, but would like to emphasize certain factors. My own conception of asthma is that it is a constitutional diathesis which lasts throughout life. We cannot change this diathesis by any treatment, but if we can remove the exciting cause, whether it be food, pollen, or animal emanation, we may symptomatically cure the patient. In children under five years of age, the exciting cause is frequently infection with fever. If we can prevent the recurrence of infections in such children they may be symptomatically cured. Vaccines, large doses of vitamin A, ultra violet radiation, have largely been a failure in preventing such infections. The only way in which we can do so is by removing the focus of infection, whether it be tonsils, adenoids or maxillary sinuses. If this is done some of the cases will be symptomatically cured. I have one boy who has been without an attack for fifteen years. In other cases asthmatic attacks return less often, but the patient will experience enough relief to make the operation worth while. In cases with marked asthmatic diathesis there may be no relief. By choosing our cases carefully and determining the exciting cause, both by history and personal observation, we will find that a respectable percentage of cases in which other types of treatment have failed can be relieved by removing the foci of infection.

DR. F. C. RODDA (Minneapolis): In the discussion of asthma, I think some confusion arises from an improper nomenclature. In certain cases an inspection of the mucous membrane of the nose and throat shows a swollen, grayish, soggy appearance. The difficult breathing is chronic and persisting. Sensitization tests are frequently of little aid. For instance, a positive food reaction may occur, but we learn the patient never takes this particular food. Removal of tonsils and adenoids helps but little. These are cases of true asthma and are most discouraging to treat. However, there is another class of cases of acute, self-limited attacks of asthmatic type of breathing. On auscultation of the chest, one hears all manner of rales—a veritable music box. Now, these cases are always associated with acute upper respiratory infections. I choose to call them acute spasmodic bronchitis. Unfortunately these patients are often diagnosed as asthmatics and are subjected to profound psychological reactions resulting from the serious attitude assumed by doctor and parents. The attacks are then more frequent and more prolonged until eventually they may suffer almost as much as a true asthmatic. The clearing up of foci of infection in tonsils, adenoids and sinuses is of great benefit to this type of case.

DR. C. N. HENSEL (St. Paul): This paper of Dr. Connor on sinusitis and asthma is difficult to discuss and yet very important to discuss. I

would be glad if some of my confreres, members of the National Society for the Study of Allergy, whom I frequently meet at allergy meetings, could have heard this paper. They certainly need to accept the fact that the problem of asthma does not reside entirely in tissue sensitization and I feel sure that some of their failures would be eliminated if they would coöperate with a rhinologist in dealing with these cases. When, as occasionally happens at one of these meetings, a rhinologist presents a paper, they are loudly vocal in denouncing it, and I have heard the same intolerant attitude expressed by the rhinologist over the efforts of the allergist to treat these cases without his aid.

Dr. Connor has wisely taken a middle ground and his pathological studies of nasal tissue have nicely shown the difference between the purely infectious type and the hyperplastic type associated with tissue sensitization. This latter type, he feels, should be thoroughly investigated by the allergist and the only surgery done in this type should be that to promote drainage.

While the pediatrician deals with the allergic patient in childhood, my approach and point of view lies largely with adults. I believe that individuals who manifest a sensitization in childhood, carry this tendency throughout life and I believe that we might do well, in taking our case histories, to inquire into the early feeding problems of the patient—as to the presence of hives, eczema, etc. A state of sensitization in an individual may remain latent and be precipitated into an active condition by some acute infectious process. The onset of asthmatic symptoms associated with an infectious process may cause the examining physician to believe that the condition is one of asthmatic bronchitis due to infection, whereas the facts may be that the infection has merely made active a latent tissue sensitization.

The skin tests may be looked upon as aids or clues in this differential diagnosis, and, using the positive skin tests as guides, and removing the individual from contact with offending allergens, should clear up a purely sensitization case. But frequently this happy result does not obtain; then I feel that it is necessary to resort to the services of an alert, competent rhinologist in order to see that there are no obstructions in the nose, spurs, or turbinate hypertrophies that may swell and reflexly produce spasm of the bronchioles, or in which there is an acute pyrogenic condition in the nasal accessory sinuses. The finding and removing of these abnormal conditions has been of such great help to me in a sufficient number of asthmatic cases that have come to my consulting room, that I have become convinced that the problem of asthma is a double-header, in many instances, and needs the service of both the allergist and the rhinologist. Sheer vanity in either specialty should not prevent one or the other from sharing the credit that may come in relieving an asthmatic patient of his distress.

In attempting to explain the condition of the nasal tissues and the susceptibility to repeated "colds" in allergic patients, I have figured it out in this fashion. Just as in making the intradermal skin tests, a positive reaction produces swelling and irritation of the skin so I believe that offending allergens circulating in the blood, may irritate the nasal mucous membranes and set up a boggy debilitated condition of the tissues which lowers their resistance to infections and makes a nice resting place where pathogenic bacteria may hibernate and start up fresh growth with any constitutional disturbance, such as the approach of menstruation, general bodily chilling, sitting in a draught, indigestion, constipation, etc. The nasal tissue in these individuals is never really free from infection. Let the offending allergens be removed from the patient's diet or environment, and let the rhinologist promote drainage through the necssary surgery, then the nasal mucous membrane will return to normal and the patient will be able to throw off this infection.

If this theory is true, then it is quite futile for the rhinologist to believe that he can cure his patients by nasal surgery alone, and it is equally futile for the allergist to expect to cure his cases without the aid of the rhinologist who can provide adequate drainage. I am, therefore, quite impressed with the honest, sane, central position that Dr. Connor has taken in this controversial subject. It is a point of view that looks toward the ultimate cure of the patient and I wish very much that Dr. Connor could present this paper before the American Society for the Study of Allergy.

Dr Connor (in closing): I do not mean to give the impression that I think there is but little indication for nasal surgery in asthma; it is a type of therapy for which there is a definite field, a therapy which is to be exhibited only after careful study. The point I wish to make is that one cannot tell simply by looking in the nose whether or not surgery is necessary; it takes more than that. Each case must be carefully studied and surgery exhibited only in those in which there is a reasonable possibility of doing good. Such cases are not infrequent.

R. T. La Vake M.D.
Secretary.

SOCIETIES

OFFICIAL CALL

To the Officers and Members of the South Dakota State Medical Association:

The Fifty-third Annual Session of the South Dakota State Medical Association will be held in Mitchell, S. D., Widmann Hotel, from Monday, May 14, to Wednesday, May 16, 1934.

The Council will convene on Monday, May 14, at 4:00 P. M.

The House of Delegates will convene on Monday, May 14, at 6:00 P. M. dinner.

The Scientific program will open on Tuesday, May 15, at 8:30 A. M.

Second meeting of the House of Delegates, Wednesday, May 16, at 7:00 A. M. breakfast.

Second meeting of the Council, Wednesday, May 16, at 12:30 P. M. luncheon.

EDWARD WM. JONES, M.D., *President.*
H. R. KENASTON, M.D., *Chairman Council.*

ATTEST:
J. F. D. COOK, M.D., *Sec.-Treas.*
Langford, S. D.

TENTATIVE PROGRAM

THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

MITCHELL, S. D., MAY 14-16, 1934

Meeting Places:

Roxy Theater and Widmann Hotel

Tuesday, May 15, 1934

8:30-9:30 A. M. Dermatological Clinic.
Francis E. Senear, M.D., Professor of Dermatology, University of Illinois, Chicago.
Assistant Clinicians—Drs. E. M. Young and L. F. Tobin, Mitchell, S. D.

9:30-11:00 A. M. Medical Clinic—Cholecystic Diseases.
Paper: "Unusual Clinical Pictures Associated with Common Duct Stone."
Albert M. Snell, M.D., Head of Section in Division of Medicine, Mayo Clinic, Rochester, Minn.
Assistant Clinicians—Drs. J. F. Malloy and J. H. Lloyd, Mitchell, S. D.

11:00 A. M.-12:15 P. M. Medical Clinic—Gastro-intestinal Diseases.
Fred M. Smith, M.D., Professor and Head of the Department of Theory and Practice of Medicine, University of Iowa, Iowa City, Ia.
Assistant Clinicians—Drs. C. S. Bobb and F. J. Tobin, Mitchell, S. D.

12:15 P. M. Alumni luncheons.

2:00 P. M. Paper: "Modern Treatment of Syphilis," Francis E. Senear, M.D.

2:45 P. M. President's Address: E. W. Jones, M.D.

3:30 P. M. Paper: "A Consideration of the Etiological and Pathological Aspects of Some of the More Important Cardio-vascular Diseases" (illustrated), J. C. Ohlmacher, M.D., Dean of the College of Medicine, University of South Dakota, Vermillion, S. D.

4:15 P. M. Paper: "The Discussion of Certain Aspects of Peptic Ulcer," Fred M. Smith, M.D.

5:00 P. M. Paper: "Some Studies on Capillaries," Irving S. Cutter, M.D., Dean of the Medical School, Northwestern University, Chicago.

6:00 P. M. Scientific Exhibits and Commercial Exhibits.

7:00 P. M. Banquet, Widmann Hotel. Speaker, Irving S. Cutter, M.D., Chicago: "State Medicine: Its Significance."

Wednesday, May 16, 1934

7:00 A. M. Second Meeting of the House of Delegates—Breakfast.

8:30 A. M. Surgical Clinic—Cancer of the Breast.
S. W. Harrington, M.D., Head of Section in Division of Surgery, Mayo Clinic, Rochester, Minn.
Assistant Clinician—Dr. W. R. Ball, Mitchell, S. D.

9:30 A. M. Medical Clinic—Pediatrics.
E. J. Heunekens, M.D., Associate Professor of Pediatrics, Medical Department, University of Minnesota, Minneapolis.
Assistant Clinician—Dr. F. D. Gillis, Mitchell, S. D.

10:30 A. M. Surgical Clinic—Osteomyelitis.
H. Winnett Orr, M.D., Department of Clinical Surgery, University of Nebraska, Lincoln, Neb.
Assistant Clinicians—Drs. W. A. Delaney and B. A. Bobb, Mitchell, S. D.

11:30 A. M. Paper: "Radiological Findings of Primary Carcinoma of the Lungs," Ralph G. Willy, M.D., Assistant Professor of Roentgenology, Medical Department, Northwestern University, Chicago.

12:30 P. M. Second Meeting of the Council—Luncheon.

2:00 P. M. Medical Clinic—Cardiology.
Paper: "The Treatment of Congestive Heart Failure," Fred W. Willius, M.D., Head of Section on Cardiology, Mayo Clinic, Rochester, Minn.
Assistant Clinicians—Drs. R. T. Rohwer and E. W. Jones, Mitchell, S. D.

3:15 P. M. President-elect's Address: W. G. Magee, M.D.

3:30 P. M. Paper: "The Surgical Treatment of Carcinoma of the Breast," S. W. Harrington, M.D.

4:00 P. M. Paper: "Care of Infant in First of Life: With Especial Reference to Infant Feeding," E. J. Heunekens, M.D.

4:45 P. M. Paper: "Osteomyelitis—Treatment Without Frequent Dressings," H. Winnett Orr, M.D.

5:30 P. M. Ralph G. Willy, M.D.—X-ray Exhibits and Demonstration of Interesting Roentgenograms in X-ray Section.
Assistant Clinicians—Drs. O. J. Mabee, D. R. Mabee and R. A. Kelly, Mitchell, S. D.

THE NORTH DAKOTA STATE MEDICAL ASSOCIATION

FARGO, N. D., MAY 28-29, 1934

Monday, May 28, 1934

9:00 A. M. Gastro-intestinal Clinic.
"Diagnosis and Medical Consideration," A. M. Snell, M.D., Rochester, Minn.
"X-ray Interpretation," B. R. Kirklin, M.D., Rochester, Minn.
"Diagnosis and Surgical Consideration," E. S. Judd, M.D., Rochester, Minn.

1:00 A. M. "Consideration of Cerebral Hemorrhage," E. M. Hammes, M.D., St. Paul.

1:30 P. M. President's Address: J. W. Bowen, M.D., Dickinson, N. D.

2:00 P. M. "Clinical Aspects of Gastric Cancer," A. M. Snell, M.D., Rochester, Minn.

2:30 P. M. "Surgical Treatment of Cancer of the Stomach," E. S. Judd, M.D., Rochester, Minn.

3:00 P. M. "Bronchoscopy in General Medicine," George Foster, M.D., Fargo, N. D.

3:30 P. M. "Heart Disease," Walter L. Bierring, M.D., President American Medical Association, Des Moines, Ia.

4:00 P. M. "Significance of Genito-urinary Bleeding," V. J. LaRose, M.D., Bismarck, N. D.

Tuesday, May 29, 1934

9:00 A. M. Clinic: "Pediatrics," E. F. Robb, M.D., Minneapolis.
Clinic: "Fractures," Wallace Cole, M.D., St. Paul.

11:00 A. M. "Safer Motherhood," John H. Moore, M.D., Grand Forks, N. D.

11:30 A. M. "Allergy," Ray Morton Balyeat, M.D., Oklahoma City, Okla.

1:30 P. M. "Concerning the Activities Against Irregular Practitioners," Judge Bronson, Grand Forks, N. D.

2:00 P. M. "Cardiac Arrhythmia," Julius O. Arnson, M.D., Bismarck, N. D.

2:30 P. M. "Poliomyelitis," E. F. Robb, M.D., Minneapolis.

3:00 P. M. "Arthritis," Wallace Cole, M.D., St. Paul.

Sunday, May 27—Afternoon

House of Delegates and Councillors meet.

Monday, May 28—Evening

The Annual Banquet.

The above is only a tentative program of our meeting at Fargo, May 28-29. Several additions and changes may be made in time for the opening date.

A. W. SKELSEY, M.D.,
Secretary.

MINNEAPOLIS SURGICAL SOCIETY ANNUAL SYMPOSIUM ON CANCER

The Minneapolis Surgical Society Annual Symposium on Cancer, devoted to the occurrence of cancer in private practice in Minneapolis, and the available means of treatment, will be held in the Hennepin County Medical Society Auditorium, April 5, 1934, at 8:00 p. m.

1. Dr. Kenneth Bulkley, President:
   1. Announcements and introduction of Cancer Committee Chairman.
2. Dr. J. Frank Corbett, Chairman:
   1. Introductory remarks.
   2. Personnel of committee.
   3. Scope of work undertaken.
3. Dr. Ivar Sivertsen, Chairman of Sub-committee:
   1. Report of survey of the incidence of cancer in Minneapolis.
   2. A detailed report of cases treated in private practice.
4. Dr. A. A. Zierold, Chairman of Sub-committee on X-ray Therapy:
   1. Report on X-ray therapy as an adjunct to surgery.
   2. Survey of facilities for deep X-ray therapy in Minneapolis.
   3. By invitation the following will collaborate on various phases of X-ray therapy:
      (a) Dr. Russell Morse, St. Barnabas Hospital. "Radio-sensitive Tumors."
      (b) Dr. W. H. Ude, Eitel Hospital. "Carcinomatous Metastases."
      (c) Dr. G. T. Nordin, Swedish Hospital. "Uterine and Prostatic Malignancy."
      (d) Dr. R. G. Allison, Northwestern Hospital. "Carcinoma of the Breast."
5. Dr. Martin Nordland, Chairman of Sub-committee on Radium Therapy:
   1. Report on the use of radium as an adjunct to surgery.
   2. Survey of facilities for radium therapy in Minneapolis.
   3. The following will collaborate on the scope of radium therapy:
      (a) Dr. Chas. R. Drake (by invitation). "Uterine Malignancy."
      (b) Dr. A. S. Fleming (by invitation). "Dangers in the Use of Radium."
      (c) Dr. S. E. Sweitzer (by invitation). "Skin Malignancy."
      (d) Dr. Wm. T. Peyton. "Cancer of the Oral Cavity."
      (e) Dr. L. M. Larson. "Cancer of the Rectum."
6. Reports of five-year cases by members of the Society.
   Only patients free from signs or symptoms five years after removal of malignancy are to be included. These reports will cover all organs of the body.
7. General discussion on the treatment of cancer in private practice in Minneapolis.

Dinner will be served to members and guests at 6:00 o'clock in the Athletic Club at $1.25 per plate. Dr. A. W. Adson, an honorary member, will speak on the "Malignancy of Brain Tumors" during dinner. Please telephone Geneva 8136 for reservations not later than noon of April 5.

F. A. OLSON, M.D., *Secretary.*
Syndicate Bldg.

NEWS ITEMS

Dr. Russell Gates, Minot, N. D., has recently returned from a months vacation in Cuba.

Dr. C. J. Glaspel, Crafton, N. D., was recently married to Miss Violet Mohagen of that city.

The American College of Physicians will hold their eighteenth annual Clinic at Chicago on April 16-20.

Dr. T. J. Irish will erect a new hospital at Forest Lake, Minn., this season, equipping the same with all modern furniture.

Dr. George S. Wattam who has been in active practice for over 50 years at Warren, Minn., died last month at the age of 77 years.

Dr. Wm. McLane, formerly located at Sleepy Eye, has moved to Jackson, Minn., where he has opened offices for general practice.

The Womans Auxiliary of the South Dakota Medical Association will hold their annual meeting at Mitchell, on May 15 and 16.

Dr. R. O. Goehl was the principal speaker at the February meeting of the Grand Forks Medical Society, his subject being "Diabetes."

Dr. C. P. Dahl, who has been located at Cottonwood for nearly 20 years, has moved to Canby, Minn., where he will continue general practice.

Dr. C. A. Butler, who has been located at Lake Preston for several years, has moved over to Eagan, S. D., and will continue his general practice.

Dr. Oscar Daignault, Benson, Minn., is taking a three months vacation in a European trip, where he will study advanced surgery at the University of Paris.

Dr. W. H. Witherstine, Grand Forks, is among the large list of physicians who are attending the annual congress of the Pan-American Medical Association at Havana.

Dr. W. A. Allen, Rochester, Minn., the oldest physician who continues his practice after celebrating his 100th birthday, received about 500 callers at his home party.

Dr. Fannie Dunn Quain, Bismarck, and Dr. Agnes Stucke, Garrison, were the principle speakers at a meeting of the Bismarck Hospital Alumnae Association recently held in that city.

The new Miller Memorial Hospital, Duluth, will be formally opened for the receipt of patients on April 15, with Dr. A. L. McDonald, as chief of staff and a board of 50 leading Duluth physicians.

Dr. E. W. Jones, Mitchell, president of the South Dakota Medical Association, was a recent guest speaker before the medical classes at Vermillion. His topic presented was "General Practitioner."

The Minneapolis Surgical Society elected the following officers at their annual meeting held on March 1: Dr. Martin Nordland, president, Dr. James Johnson, vice-president, Dr. Richard Cramer, council.

Dr. E. G. Balsam, secretary of the Montana Medical Association, has announced that one of the best programs ever presented by their association will be issued for their annual meeting at Helena on July 10-12.

At the March meeting of the members of the District Medical Society held at Watertown, S. D., Dr. H. A. Reiman, University of Minnesota, was the guest speaker, his subject being "Treatment of Pneumonia."

Dr. Harry Aldes, who has been on the staff of Bethesda Hospital, St. Paul, for over 20 years, died on March 22, after an illness of only ten days. Dr. Aldes was a graduate of the medical school of the University of Illinois.

Dr. William Peyton, chief of the cancer surgery institute of the University of Minnesota at Minneapolis and a nationally known figure in medical circles, has recently returned to Minneapolis, after a two weeks lecture tour in North Dakota.

The South Dakota Academy of Ophthalmology and Otolaryngology will hold their annual meeting at Mitchell, on May 15, presenting the following program: 9 a. m.—John B. Potts, M. D., "Focal Infection Secondary to Chronic Hyperplastic Sinus Infection." 10 a. m.—C. E. Robbins, M. D., "Temporo-Sphenoidal Abscess." 11 a. m.—H. L. Saylor, M. D., "Oral Sepsis and an Interesting Eye Case."

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters). Speaker, William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of April will be as follows: April 4, "Congenital Heart Disease"; April 11, "Diphtheria"; April 18, "Health Value of Play"; April 25, "The Cancer Problem."

The JOURNAL LANCET

Minneapolis, Minnesota
April 15, 1934

New Series
Vol. LIV, No. 8

Carcinoma of the Rectum and Rectosigmoid*

John deJ. Pemberton, M.D.†
Rochester, Minn.

IN A discussion of carcinoma of the rectum and rectosigmoid, one of the oldest diseases known to man, as well as one of the most common malignant conditions involving the gastro-intestinal tract, I cannot hope to present anything new, or even to offer any radically improved method of treatment. However, it is my hope that relating some of the problems which confront the surgeon may lend emphasis to the fact that today carcinoma of the rectum constitutes a direct challenge to the combined resources of the medical profession, a challenge which must be met by a united front. However, in the final analysis, it is apparent that victory lies in the realm of the general practitioner, who, if alert and thorough in his examination, has the opportunity of detecting the disease in its early stage, while it is still amenable to surgical attack.

The rectum and rectosigmoid, the distal 14 to 16 cm. of the intestinal tract, is one of the common sites of carcinoma, and exclusive of the stomach it is the most frequent site of carcinoma of the gastro-intestinal tract. Among the 1,205 patients with carcinoma of the alimentary tract seen in The Mayo Clinic in 1931, the oral cavity was involved in 22.5 per cent; the esophagus, in 6.2 per cent; the stomach, in 35 per cent; the rectum and rectosigmoid in 21.7 per cent, and the entire colon, exclusive of the rectum, in 14.6 per cent. Thus it will be seen that the rectum is involved once in every five cases of malignancy of the alimentary tract. The disease is met with more frequently among men than among women, and may afflict patients of any age, from childhood to extreme old age, although the great majority of patients are more than forty years of age.

In spite of the well known predilection of carcinoma for the rectum, and in spite of the intensive educational campaigns carried on by the medical profession to instruct the laity in regard to the prevalence, symptoms, and curability of carcinoma, early diagnosis of this disease continues to be the exception rather than the rule. It is a curious fact that carcinomas of other portions of the gastro-intestinal tract, detection of which, on account of inaccessibility to touch or sight, is dependent on highly specialized knowledge and equipment, are commonly diagnosed earlier after onset than rectal carcinomas which are usually within easy reach of the examining finger, and always within range of the sigmoidoscope. This apparently anomalous condition is chiefly attributable to two major reasons: (1) the early and sometimes long latent period in which rectal carcinomas, particularly those limited to the ampulla, may exist without producing symptoms of sufficient concern to the patient to induce him to seek examination, and (2) failure of the physician to examine the rectums of

*Read before the North Dakota State Medical Association, Valley City, N. D., June 1 to 2, 1933.
†Division of Surgery, The Mayo Clinic, Rochester, Minn.

all patients who present symptoms referable to the gastro-intestinal tract.

Unfortunately, the only characteristic feature of very early rectal carcinoma is absence of any distinctive symptoms. In fact, it happens not infrequently that the patient with rectal carcinoma is wholly unaware that anything is the matter with him until the disease has advanced to the point of obstruction or perforation, when its presence is revealed by abdominal cramps and distention, or by pain localized in the pelvis or referred along the distribution of a nerve. Commonly, however, during the early stages some irregularity of intestinal habit is noted by the patient. This may be manifested by periods of constipation or diarrhea, or by alternate periods of constipation and diarrhea, or by a vague sensation of fullness or heaviness in the pelvis, or by the sensation after defecation that evacuation has been incomplete. Constipation, when present, is not obstructive in type and therefore is not associated with cramps or abdominal distention, and because the constipation can be partially regulated by the taking of laxatives, the patient may not become unduly concerned, accepting the condition as a natural accompaniment of age, diet, or mode of living. Diarrhea may be intermittent or chronic, and often is characterized by the frequent passage of small, liquid or semi-solid stools, and by the fact that the urge to go to stool is greater in the day than at night. The stools may or may not contain grossly detectable mucus and blood. Because frequency of stools is a prominent symptom in about a fourth of the cases of rectal and sigmoid carcinoma, it is obvious that diarrhea of adults, which persists for three weeks or longer, should always excite grave suspicion. As the disease progresses, and ulceration of the surface, or sloughing of a portion of the malignant growth takes place, bleeding follows, to become evidenced by blood-streaked stools or by frank hemorrhage. How early this may occur after inception of the carcinoma is not known. From clinical experience one would judge this to vary according to the type of carcinoma and its degree of malignancy, for in some cases it is an early sign, whereas in others it is a late sign or is absent altogether. However, in study of the symptoms presented by a large number of patients with rectal carcinoma, one quickly realizes that bleeding is the most significant and most constant sign, and commonly it is the first symptom to be noted by the patient. In a series of nearly 2,000 cases of rectal and sigmoidal carcinoma reviewed by Buie, a history of bleeding was recorded in 84 per cent. It is interesting that in this series, in spite of the high incidence of bleeding, anemia was not a prominent feature, as is apparent by the fact that the average value for hemoglobin was 72 per cent. Pain, which in the minds of the laity is commonly associated with carcinoma, is conspicuously absent in the early stages of the disease. Only when carcinoma involves the anal canal, which occurs in less than five per cent of all cases of rectal and rectosigmoidal carcinomas, is pain an early symptom. Here the growth, subject to constant trauma of the sphincter muscles, soon undergoes ulceration, and because of the exquisite sensitiveness of this region, pain is always an early and distressing symptom. On the other hand, growths limited to the ampulla and rectosigmoid, which do not possess sensitiveness to pain, may progress for many months without producing any pronounced local discomfort. Pain is not experienced until the carcinoma either has perforated the wall of the bowel and invaded neighboring structures, or until it has produced stenosis of the lumen. Pain, therefore, indicates an advanced process, and accordingly must be considered of greater prognostic than diagnostic significance. Copious hemorrhages, and the frequent passage of excessive mucus, occur only in the late stages, when the lesion has become deeply ulcerated. Deformed stools, commonly stressed as a symptom of rectal carcinoma actually appear in only such a small percentage of cases (about 15 per cent) in which there are lesions of the ampulla of rectosigmoid, that one is justified in minimizing their significance. On the other hand, they are almost constant accompaniments of carcinoma involving the anal canal.

Excessive loss of weight and strength, and anemia of high grade, commonly the manifestations of the spread of carcinoma, are usually greatly delayed in this disease. To me, this is one of the most interesting and hopeful features of rectal carcinoma. Not infrequently I have had patients who on examination were found to have large, fixed carcinomas of the ampulla of twelve or eighteen months' duration, yet who were otherwise in apparently good physical state. Other evidence of the relatively high percentage of malignancy of low grade, and of tendency to late metastasis, is furnished by post-mortem examination of patients who have died of the disease. McVay, in a study of 100 cases, found that in 53 per cent there was no involvement of the regional nodes, in 30 per cent, slight involvement, and in 17 per cent, marked involvement. It is clearly evident, therefore, that it is impos-

sible to diagnose carcinoma of the rectum from the symptoms alone, for these may exist in part or in whole in association with a variety of other conditions of the alimentary canal. However, if the disease is to be detected in the early stages of its development, it is equally apparent that its insidious onset and the latency of its progress be fully appreciated by the laity, as well as by clinicians, so that proper investigation will be instituted in all cases of protracted and unaccountable constipation, diarrhea, and bleeding.

The diagnosis is usually readily made by digital or sigmoidoscopic examination. In a very large majority of cases of rectal carcinoma, including many involving the rectosigmoid juncture, the tumor can be palpated by the examining finger. Yet it is the observation of every surgeon experienced in this field that a distressingly large percentage of his patients have been previously treated for other conditions, commonly hemorrhoids or dysentery, during the period in which symptoms of rectal carcinoma were present. From our records, Buie has estimated that one of every five patients with rectal sigmoidal carcinoma has been given treatment for hemorrhoids or some anal trouble other than malignancy in the year previous to admission to the clinic. This can mean only one thing, that is, that for some inexplicable reason the physician does not include in his routine the examination of the rectums of patients with complaints referable to the gastro-intestinal tract. It has been said that primary examination of the rectum is a privilege always reserved for the consultant. At the clinic it is the practice, in the course of proctoscopic examination, to excise from each rectal growth a specimen for microscopic examination. This can be readily accomplished without additional discomfort to the patient, and as experience has proved, without danger of dissemination of carcinoma. The procedure serves not only for absolute verification of the clinical diagnosis, but the microscopic grading of the carcinoma is a valuable aid, in some instances, in determining the type of operation most suitable for a given patient. Although the question of the most satisfactory type of operation is a point of considerable controversy among surgeons, there can be no difference of opinion among those experienced in treatment of this disease, the operative removal of the lesion offers the best chance of cure. In fact, exclusive of carcinoma of the lip, rectal carcinoma is more amenable to operative removal than carcinoma of any other part of the alimentary tract. Unfortunately, in 15 to 40 per cent of cases, patients who present themselves for treatment cannot be subjected to operation with reasonable safety or with reasonable hope of cure, because of the advanced stage of the disease, because of the high degree of malignancy present, or because of debility resulting from old age or intercurrent disease. For patients in this group, treatment by radium and roentgen rays is indicated. This involves little risk, and to many patients it has afforded marked palliation by reducing pain and discharge and by checking the bleeding. Even under the most favorable circumstances, the risk attendant on operations on the rectum and colon is relatively great if compared with that of major operations on other portions of the alimentary tract. Obviously the difference in the number and virulence of the bacteria resident in the different segments of the alimentary tract readily accounts in large measure, for the difference in operative hazards. Although the stomach, duodenum, and proximal three-fifths of the small intestine are relatively free of pathogenic organisms, the rectum and colon are teeming with them. However, in recent years, consequent on improvement in the surgical treatment of patients with rectal carcinoma, the mortality rate (calculated on the basis of number of patients rather than on the basis of number of operations) has been reduced to 10 per cent or lower. This reasonably low mortality rate is attributable to two major factors, namely, a routine for preparation of the patient, and care in the selection of the type of operation.

In my opinion, the most important advance made in recent years in the surgical treatment of patients with colonic and rectal disease has been improvement in preoperative preparation. Reference of patients with these diseases to a special group of the staff, and their segregation in a section of the hospital, has proved advantageous. The additional experience gained by a team of physicians and nurses not only affords opportunity for more intensive study of the many problems involved, but also insures more careful execution of the details of treatment. The specific purposes of the preoperative treatment may be classified as follows: (1) to rehabilitate the patient by institution of measures for combating dehydration and anemia, such as transfusions and intravenous administration of saline and glucose solution; (2) to relieve obstruction by application of stupes to the abdomen and by repeated enemas and irrigations of the bowel; (3) to cleanse the bowel by repeated irrigations and by placing the patient on a residue-free diet and (4) to combat infection by injecting into the

peritoneal cavity a vaccine prepared from bacteria (colon bacilli and streptococci) obtained at necropsy from the hearts' blood of patients who have died as a result of peritonitis. Because of the variable factors involved in the production and spread of infection following operation, it is not possible to evaluate accurately the effect of intraperitoneal vaccination on convalescence or mortality rate, but it is significant that the incidence of deaths from peritonitis fell noticeably after its employment as a routine.

Probably in no other disease is the immediate and ultimate outcome of surgical intervention more dependent on selection of the type of operation than in carcinoma of the rectum. A common error in the past was to fit the patient to the operation, rather than fit the operation to the individual requirements of the patient. The object sought in surgical treatment of rectal carcinoma, as of carcinoma elsewhere, is eradication of the diseased tissue with minimal risk to life, and with minimal sacrifice of anatomic structure and function. However, it is only occasionally that all these requirements can be fulfilled. When the growth is a malignant polyp or an early papilliferous growth of low grade of malignacy, the lesion may be successfully treated by local excision or cauterization. And, occasionally, similar lesions of low grade in the lower part of the ampulla may be satisfactorily removed by segmental resection of the rectum, thus restoring continuity of the rectal channel without sacrificing the sphincters. Unfortunately, however, in a very large proportion of the cases of rectal carcinoma, either because of the site of the lesion, the advanced stage of the process, or the high degree of malignancy, it is not possible to excise the affected segment of the bowel, together with its regional lymphatic structures, without sacrificing intestinal control. To restrict the operative maneuver in order to preserve control would make impossible eradication of the disease. For these patients, then, it is necessary to make an artificial anus, either before or at the time of excision of the rectum. The essential difference in the various types of surgical procedure for resection of the rectum consists essentially in the extent to which the lesion and its zone of lymphatic structures are removed. For growths involving the rectum in its lower half I believe that the most satisfactory operation is colostomy followed in three to six weeks by resection of the rectum through the posterior approach (Kraske). If, in exploring the abdomen at the time colostomy is established there is no involvement of the lymph nodes along the course of the superior hemorrhoidal vessels, or no other evidence of distant metastasis, removal, through the posterior route, of the anus, rectum and rectosigmoid, together with the retrorectal nodes, affords an excellent chance of cure, with minimal risk. The chief objection to this method is that occasionally the distal, inverted end of the blind segment of sigmoid subsequently opens, and mucus drains into the posterior wound to form an annoying and sometimes permanent fistula. For lesions in the upper part of the rectum, involving the rectosigmoid, the most rational method of surgical attack from the standpoint of cure is a combined abdominoperineal operation in which the rectum and the entire segment of the sigmoid distal to the colonic stoma, including the retrorectal, the superior hemorrhoidal, and paracolic lymphatic structures, are removed through the combined abdominal and sacral routes. The operation may be done in one stage or two. Because of the frequency with which rectosigmoid carcinomas are obstructing, I believe that preliminary establishment of an inguinal colonic stoma materially adds to the safety of the operation. Obviously this method is a more hazardous procedure than the operation of posterior resection, and this should restrict its employment to a group of carefully selected patients. To attempt it in treatment of aged debilitated, or obese patients would be folly. Its applicability is adequately summed up in the statement of Pfeiffer: "To overload the operation with those who cannot endure it and to deny those who can endure it, the added security which it affords, is equally unwise."

Discussion on Paper of Dr. Pemberton

Dr. R. H. Waldschmidt, Bismarck: Owing to the fact that Dr. Quain was prevented from attending this meeting, I have been asked to take his place on the program. The essayist has given us a most stimulating and instructive lesson on the subject of cancer, a topic which assumes a greater and greater importance as time goes on. I shall not attempt to discuss any special part of his paper, but confine my contribution to the report of a rather unusual experience developing from this disease.

Acute intestinal obstruction due to intracolonic neoplasms not infrequently calls for an emergency operation which then for the first time reveals a carcinoma, hitherto unsuspected. The case I shall report presents another complication produced by certain tumors which might also be classed as a surgical emergency.

Mrs. S., aged 45, entered the hospital on

March 18, 1933. Family history negative; father and mother living and well. Previous to this illness she had always enjoyed good health, and had never had occasion to consult a physician or take medicine or treatment of any kind. Her menstrual history was normal. VII Para. Her present illness began five weeks ago with a mild attack of pain in the left lower quadrant, which continued for three weeks. At this time she noticed a beginning enlargement of the abdomen. This increased rapidly and four weeks after the initial onset of the illness she had difficulty in breathing with nausea and eructations. Her bowels moved normally. She was seen by her local physician and referred to us for treatment.

On examination we found a well developed and nourished, but very ill looking and very dyspneic individual with an enormous enlargement of the entire abdomen. The subcutaneous abdominal veins were dilated. There was a large, dull, semifluctating mass filling the entire lower abdomen. There was no fluid wave demonstrable. The abdomen was very tender. Beyond these findings and the distress from the tension, the examination was essentially negative. The complete blood count showed: Erythrocytes 4,640,000; leukocytes 14,900; hemoglobin 67 per cent. Differential count: Polymorphonuclears 88 per cent; lymphocytes 10 per cent; mononuclears two per cent. Repeated urinalyses showed specific gravity 1.023, acid reaction, albumen ++, and a few pus cells. The blood urea was 31 milligrams.

A tentative diagnosis of a ruptured ovarian cyst was made.

Since the case evidently required early treatment, it was deemed inadvisable to X-ray her gastrointestinal tract for fear of injuring an intestine already in trouble.

On March 20, 1933, Dr. Quain performed an exploratory operation through a median hypogastric incision. Large quantities of yellowish gelatinous material escaped. The intestines were crowed up toward the diaphragm. The omentum was hanging into the gelatinous masses. Large quantities of this material were scooped out with the hand, but frozen section later revealed no evidence of malignancy. There were fragments of white fibrinous material mixed with the gelatinous substance among the folds of the omentum. In attempting to dislodge the gelatinous masses free bleeding was encountered coming chiefly from the tissues of the omentum and peritoneum and most pronounced from the pelvic region. Due to this extensive oozing, further exploration was out of the question. The bleeding was controlled by gauze packing and the wound partly closed. At this time, diagnosis of an inoperable, multiple and progressive myxomatous tumor, probably from a ruptured ovarian cyst was made.

Her post-operative recovery was uneventful during the first seven days. Large quantities of the gelatinous material escaped daily. At the end of this time an attempt was made to irrigate the cavity with normal saline solution to aid in the removal of the mucilaginous masses. However, she became progressively weaker, while her abdomen assumed a distension even more marked than before the operation. There was some vomiting although the bowel movements and passing of flatus were normal. She expired one month after the exploratory operation.

At the autopsy the lower abdomen was found to be filled with a gelatinous mass of necrotic tissue. The uterus and adnexa were normal. In the upper end of the sigmoid there was a tumor measuring six centimeters in length which proved to be a perforating gelatinous carcinoma. There were no evidences of glandular or hepatic metastases.

Dr. Quain has operated on two cases of pseudomyxoma of the peritoneum which were caused by ruptured ovarian cysts. The differential diagnosis between these two origins is probably impossible without exploration or autopsy. In reality it makes little difference, since both are fatal. An examination for the primary growth, if found, will determine the origin. In pseudomyxoma of the peritoneum there is an absence of the rapid cell proliferation and invasion and no distant visceral metastases are found. The secreting cells in the globules of fluid are difficult to find, while in carcinoma the malignant changes are more evident. Tumor tissue cells are abundant and the staining characteristics of the chromatin material are more pronounced in carcinoma. It is impossible to remove all of the gelatinous material. It forms continuously, and soon produces a mechanical effect on the vital organs by compression and interference with peristalsis and with the diaphragm. Radiotherapy is useless. The prognosis is always bad.

Laboratory Diagnosis of Amebiasis

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THAT the laboratory diagnosis of amebiasis is attended with some difficulty should be evident to everyone. However, that difficulty is not insurmountable even in the hands of those who are not trained in the finer procedures of laboratory technic.

The distinction between the entamoeba histolytica and that harmless invader of the human intestinal tract, the entamoeba coli, is easily accomplished under certain conditions; though more difficult of attainment under less favorable conditions.

One who has never seen an amoeba or who has forgotten what they look like, might mistake oil globules, air bubbles, etc., for the vegetative type of the organism though it is difficult to understand how such a mistake can be made if comparison of what the microscope reveals is made with the illustrations found in any laboratory manual, text on parasitology or in many textbooks on medicine. Much more difficulty is encountered in distinguishing cysts and differentiating the cyst forms of entamoeba histolytica and coli. The untrained observer may even mistake epithelial cells, leucocytes, and other particles for cysts. Here again the illustrations and descriptions of laboratory manuals and other texts will be helpful.

The ideal diagnostic procedure in a suspected case of amoebic dysentery is to obtain a freshly voided sample of feces, that is, a specimen that still retains the body temperature. This implies, of course, that the feces should be voided in a place readily accessible to the laboratory. Not only should the feces be at or near body temperature when received but they should be kept at body temperature. In well equipped laboratories this may be done by placing the receptacle containing the feces in an incubator. When no incubator is available the feces may be kept warm by immersing the receptacle in a large pan, pail or other container to which has been added a sufficiently large amount of hot water to provide the proper amount of heat. Various other methods for maintaining the feces at or near body temperature may be employed. It should not require much ingenuity on the part of the operator to provide such means. It is best that the receptacle for the feces be of comparatievly thin metal, porcelain or glass. After the slide is prepared it may be kept warm either by a warm stage microscope, or by placing it across the mouth of a large bottle (quart milk bottle) containing hot water. If the suspected individual is suffering from diarrhea at the time the examination is made the stools will be liquid or semiliquid and need not be diluted. Also they are apt to be streaked with mucus and blood. When mucus is found it should be fished out and examined as here one is most apt to find the amoeba. In case the feces are apt to be formed it is well to instruct the patient to take a saline cathartic the night preceding the examination. Castor oil or mineral oil should not be given as globules of this material appear in the feces and by the untrained may be mistaken for amoeba. The same may be said for air bubbles.

Selecting a bit of mucus, a small drop is placed on a slide and a cover glass compressed gently over it. The resulting smear should be thin enough so that one may observe print letters through it. By this method one may observe both quiescent and motile organisms. These organisms usually contain erythrocytes. If erythrocytes are present within the cytoplasm of these amoeba, whether in active motion or quiet, the diagnosis of amoebic dysentery should be made.

A simple method for demonstrating the quiescent vegetative or cyst forms in feces which have not been observed under the ideal conditions cited above, is as follows: Donaldson's method—Prepare solutions I and II. Solution I: Ten per cent eosine in 0.9 per cent sodium chloride solution. Solution II: Two per cent iodine and five per cent potassium iodide in 0.9 per cent sodium chloride solution. Keep solutions in separate bottles. Place on slide a drop each of these solutions close to each other—mix these well. About one-half inch from this drop of stain solution thin out a small shred of mucus or feces in a drop of 0.9 per cent sodium chloride solution. Apply cover slip so that it will cover both drops. At the margin of the stained area the amoeba and their cysts take on a yellow color with distinct nuclei while other structures stain pink. This procedure permits one to make a rapid examination for cysts.

The cysts of the endamoeba histolytica are about the size of a pus cell and contain from one

(Continued on page 230)

The Practical Management of Diabetes Mellitus*

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THIS paper was prepared for the purpose of placing before the doctor in general practice a few essential and practical points concerning the treatment of diabetes mellitus; which, if carried out in urban practice, will aid greatly in reducing diabetic mortality. I speak of urban practice because it seems that clinics, hospitals and specialists report a decrease in deaths, while country and state rates at the best show doubtful improvement.[4] The doctor in general practice is busy with surgery, obstetrics and some medicine and he is inclined to be negligent of the diabetic patient who requires a little more of his time than the average patient. As the expression goes, "The patient is instructed in the use of the insulin syringe and allowed to go on his way." Good results in diabetes depend upon conscientious management.

Diet

The importance of diet in this disease need not be stressed, but I do think it is essential for me to mention something of the type of diet. Beard[2] in a recent discussion of diabetic diets has shown how the pendulum of American diets has swung from one extreme to the other, and he points out how the same thing has occured in diabetes. A few years ago the talk was about high fat diets with the thought that success in the treatment of this disease had been attained. Within the last year or two some medical scientists[11] have advocated the other, or high carbohydrate, low fat diet. In recent years Sansum and Rabinowich and their workers have gradually increased the amount of carbohydrates allowing diets consisting of approximately 200-300 grams of carbohydrates daily. May I say here that such procedures, as yet, are based on theory and scientific investigation, since it is thought that a high carbohydrate low caloric diet increases glucose tolerance, decreases danger of acidosis, and minimizes blood cholesterol thus reducing the complication of arteriosclerosis.[15] [5] This all sounds very good but at present I will advise the average doctor to select the diet which is most practical, conservative and yet beneficial to the patient, namely the medium carbohydrate diet of about 100 to 125 grams per day.[2] [7] Impractical points in this regard are first and foremost, that many patients cannot afford to buy the additional amounts of insulin necessary for a high carbohydrate diet, and secondly, with such a diet it is more difficult to keep the patient regulated.

Having clarified oneself on the type of diet to use, the question then arises of chosing a diet. Where must one start in selecting a diabetic diet? Here it is essential to always individualize the patient. Normal weight of the patient should be strived for. If he is obese a low fat low calorie diet should be employed; if underweight a high fat diet. In an elderly patient it is not well to keep the blood sugar down too low because of complications I shall mention later. Elaborate and technical methods of calculation may be employed, but from a practical standpoint this is unnecessary. It is well to use the basal requirement of a patient with which to start, and this may be easily calculated from the readily available charts. In fact there is no great harm in arbitrarily selecting this figure since for most adults it is in the neighborhood of 1,500 calories. In children, of course, this must be handled with more caution. As a rule we may take basal requirements plus 50 per cent which is about 1,800 to 2,400 calories per day. Or still easier is to figure 30 calories per kilogram of body weight for a maintenance diet. Children should receive from 45 to 80 calories per kilogram body weight depending upon age.[6] The aportionment of this amount into carbohydrate, protein and fat need not cause undue worry. One gram of protein per kilo of normal body weight is considered satisfactory; then by arbitrarily taking 90 to 125 grams of carbohydrates the remainder is made up of fat. The specific foods for the daily menu may then be worked into this diet, and where hospitals are available, the dietary department may take care of that phase. Thus we may see that the calculation of a diabetic diet is a relatively simple task, and should for no reason suffer the neglect of the doctor.

Education

Education of the patient is by no means a small part of the diabetic treatment, and should therefore, require all the sympathy, consideration and patience that is within the power of the physician. They must thoroughly understand the examina-

*Presented before the Grand Forks District Medical Society, February 21, 1934.

tion of urine, the use of insulin, the portioning of their diet and the complications of diabetes. For this purpose one of the diabetic primers should be presented to each patient, so that he may thoroughly understand the disease with which he is afflicted. I find the manual edited by Wilder very satisfactory. Best results in this regard may be accomplished by placing the patient in a hospital for a few days when such an arrangement is possible. This brings me to a point which I wish to emphasize evry strongly, i.e., that it is often impractical and unnecessary to instruct a patient in the intricacies of weighing their diet. Many of the less intelligent people find it beyond their faculties to comprehend the subject, and furthermore object to purchasing a scale. Measuring the diet brings satisfactory results in the great majority of cases and therefore should be more widely employed. For this purpose I find Waller's[16] little manual, which gives the weight and measure equivalents for almost every conceivable food, very helpful.

In the matter of urine examinations it is a good plan to have the patient examine his specimens one or two hours after every meal for a period of a few days after or during adjustment. If the patient gives the doctor a good qualitative report or if the physician himself does a quantitative determination on these fractional specimens it will aid greatly in adjusting the insulin dosage according to the period of the day in which most sugar is excreted. By so doing it is sometimes possible to avoid hypoglycemic reactions. Also, it is possible to sometimes omit one of the daily injections or even two of them, and this is always pleasing to the patient. Twenty-four hour specimens should certainly be used if the fractional ones are not to be observed. Blood sugar determinations are very valuable in the management of a diabetic patient, but where the physician does not have access to this procedure, urine examinations if properly watched bring exceedingly good results.

Insulin

The use of insulin in diabetes has at times been needlessly and disastrously restricted, probably by an exaggerated fear of its danger or a feeling of unsureness in the dietetic management of the disease. This astonishing fear of insulin in the medical profession should be abandoned, for a great share of it is ungrounded. There have been erroneous ideas such as "that insulin once begun can never be discontinued." In children perhaps it is more difficult to discontinue insulin, but formerly diabetic children lived a year or two of miserable life and then died in coma. Now there are hundreds who look and act like normal children. In many surgical conditions and infections complicated by diabetes, insulin is necessary in the pre-operative and post-operative care, but may be discontinued later. Acidosis is the constant hazard in diabetes. In order to prevent acidosis complete fat oxidation is necessary and this is dependent upon sufficient glucose oxidation which requires an adequate amount of insulin. The use of insulin in the ordinary case of uncomplicated diabetes is relatively simple. It must be remembered that a normal person may take from five to ten units of insulin before each meal without untoward effects. In most of the hospitalized patients the quickest way of regulating the cases is by using insulin and a maintenance diet from the start. The idea of first beginning on a low or starvation diet is obsolete.

Frequently the question is asked: How do we know how much insulin is necessary? The answer is that we never know but find out from experiment. One means of doing this is to place the patient on a conservative insulin dosage, say ten units before each meal; then, determine the amount of sugar excreted in the 24 hour specimen or in the four fractional specimens if that method is used. According to this one may then add one unit of insulin for every two grams of glucose excreted. If the quantitative determination of sugar cannot be carried out then a qualitative method may be used as follows: The urine is tested before each meal. If the solution turns red give 20 units, if yellow give 15 units and if green give 10 units.

One thing that may alter this entire insulin regime is the occasional case of insulin resistance or insulin sensitivity. The tolerance of a diabetic patient for insulin may be increased by infection, coma and acidosis; also hepatic disease and endocrine disturbances may have a similar effect. On the other hand, there are some cases in which the patient may be extremely sensitive to insulin. There are practical advantages in distinguishing insulin-sensitive and insulin-resistant cases as MacBryde[8] has recently pointed out. I have known of one case in which it was necessary to give good doses of crystalline insulin before any response in the condition of the patient was obtained. A better understanding of the metabolic disturbance in each case would result in making possible a more intelligent adjustment of diet and insulin.

Another point regarding insulin therapy which is rare but should be kept in mind is that insulin may provoke allergic manifestations.[12]

Acidosis and Coma

The medical profession is well aware of the

great hazard in diabetic coma and acidosis but nevertheless there are still many fatalities from this complication of diabetes. According to reports of the Metropolitan Life Insurance Co. in 1930, coma occured in 37 per cent of fatal cases of diabetes.[1] Every diabetic should be instructed to seriously guard against such a dangerous complication, and physicians should be prepared to deal with it promptly and effectively when it occurs. A thorough understanding of the three disturbing factors is necessary for successful treatment of diabetic acidosis. These are toxemia from the presence of ketone bodies, disturbance of the acid-base equilibrium and dehydration, all of which are aided by the use of insulin.

The importance of urine examinations can never be stressed too often nor too emphatically, for it is by this means that prophylaxis may be practiced in diabetes. No matter whether it be infection or some endocrine disorder or neither that throws the diabetic off balance, we must remember that a glycosuria usually always precedes the acidosis.

Here I wish to strongly emphasize a point regarding acidosis and hyperglycemia in diabetes. For some unknown reason there seems to be an overwhelming tendency for physicians to pay more attention to the blood sugar than to the acidosis, when the reverse should be the case. It seems to me that too little emphasis is placed on this extremely important point, and many physicians have been graduated from medical schools, and have started practice without grasping the fact that it is not the unusual hyperglycemia from which comatosed patients die, but rather the severe acidosis. Too often have I seen medical students, interns and physicians become alarmed at an excessively high blood sugar, when the degree of acidosis should concern them more. If I were to choose between either a CO_2 combining power or a blood sugar determination in a known diabetic patient in coma I should certainly take the former. Acidosis can very easily be watched by a simple urine analysis using the Gerhardt ferric chloride test for diabetic acid or the qualitative acetone determination. The Van Slyke CO^2 combining power determination on blood plasma is very helpful, but all physicians treating diabetic acidosis do not have the advantages of such a complete laboratory. As Foster[4] has said, and it is supported by Allen[1], that the proceedure in diabetic coma is to give adequate amounts of dextrose and adequate amounts of insulin with attention first to the acidosis, letting the glycosuria wait.

It is difficult to lay down any definite rule regarding the initial dose of insulin; however, any adult patient who is in a state of acidosis with glycosuria may be given 20 to 30 units at once; if the patient is in coma, 50 to 70 units may be used; and if the condition appears very critical, 80 to 125 units should be given without hesitation some of which may be given intravenously. The subsequent dosage of insulin, of course, depends upon the clinical progress of the case. Where complete laboratory facilities are available the acidosis and hyperglycemia may be watched very closely; however, I wish to state that as far as the ultimate outcome goes in the management of diabetic coma, the results may be just as good without blood sugar and CO_2 combining power determinations. Close observation of the urine for the amount of glycosuria and ketone bodies is all that is really necessary in the majority of cases. A good method of doing this, if the patient is in coma, is to insert a retention catheter thus allowing one to obtain a small specimen at any time, almost as soon as it is excreted. Such specimens should be examined every hour if the patient is in coma, and insulin is then given according to the test. If the standard Benedicts qualitative test course turns red, 40 units may be given; if yellow, 20 units; if green, 10 units. There is no excuse for allowing the blood sugar to become greatly lowered while the patient is still in profound coma. If there is doubt about this point, by all means give glucose, for as I have already said, hyperglycemia is not to be feared in these cases. When the ordinary apparatus for administering intravenous solutions is not available, 50 per cent glucose from ampuoles may be injected intravenously.

Next in importance to the administration of insulin to oxidize glucose is the administration of fluids to overcome the dehydration. At least three to four thousand c.c. of fluid should be given in 24 hours by any one or several of the customary routes of giving fluids. Nourishment is the next point which must receive attention. As soon as the patient can tolerate food by mouth, fruit juices and a soft diet may be prescribed, the caloric value of which should be known.

The use of alkali in diabetic coma has been a debated problem. Some authors advise against its use, because there may be recovery without it and because harm has been done by the intensive use of alkali as formerly practiced. In cases of severe coma there is no harm and sometimes great benefit derived from the conservative use of sodium bicarbonate.[1] From 10 to 12 grams may be given by stomach tube after gastric lavage without worry. If coma is prolonged this dose may be repeated, and especially if the CO_2 combining power remains below 20. If the case is des-

perate sodium bicarbonate may be given intravenously in the amount of 300 c.c. of five per cent solution.

On the face of it, alkali therapy in such cases sounds rational for this reason; that such treatment will help to re-establish the acid-base equilibrium not by neutralizing the ketosis but by supplying depleted basic ions with which the disturbed alkali reserve of the body may be more readily built up. There are certain cases in which the carbon dioxide combining power of the blood remains low for hours after the ketone bodies have disappeared from the urine. Such cases may be definitely benefited by the administration of small doses of alkali.

Circulatory failure must be guarded against in cases of severe coma and acidosis. If digitalis is used it should be given in sufficiently large dosage, say two or three cat units every four hours for three or four doses. Caffine, metrozol, adrenaline and other cardiac stimulants are sometimes used. Most important of all is keeping up the blood sugar level.

In mentioning the heart in diabetes, I certainly must not fail to stress the importance and the relationship of the blood sugar level to anginal and coronary syndromes. Strouse, et al.,[14] have recently presented a series of cases to show the effect of hypoglycemia on the damaged myocardium and on the heart of elderly diabetics. Root and Graybill[10] have further emphasized this point as well as other observers.[7] In elderly diabetics, especially those with arterial disease or with history of coronary disease and anginal attacks, it is known that some will have attacks of precordial pain, sometimes serious, if the blood sugar is lowered too rapidly or if the glycemia becomes too low. For this reason it is wise to handle such patient cautiously. It is felt that this effect is not due to insulin but actually to the hypoglycemia. It is possible that for such patients, the higher blood sugar levels usually found do represent the "normal" or perhaps optimum value as far as their cardiovascular system is concerned. The increasing occurrence of heart disease as a cause of death in diabetes should serve as a warning regarding the needs of the myocardium, and it must not be forgotten in our efforts to control the metabolic disturbances of diabetes. Remember that coronary deaths have occurred while attempting to reduce the blood sugar.[3]

Pregnancy in diabetes is deserving of mention in a paper of this sort, and when such a complication does occur it should receive serious consideration. The disease is usually aggravated by pregnancy, and, as a rule, is more difficult to control; consequently strict prenatal care in such a case is essential. It is a great menace to the unborn child which frequently suffers intra-uterine or neonatal death. Where such a complication is suspected due to former history or family history, frequent and careful examinations of urine and, more particularly, periodic determinations of blood sugar should be done. An elimination of the diagnosis of diabetes on urine examination alone is a bit dangerous because the patient may have a high sugar threshold. The opposite, sugar in the urine, is also true since a low threshold may allow sugar to spill over into the urine. Furthermore, a possibility of lactose in the urine should always be kept in mind. A thorough study of this factor of variation in renal threshold has been made recently by Powelson and Wilder,[9] who emphasize the importance of additional study in such suspected cases. Ronsheim[13] feels that in cases of recurrent miscarriages or stillbirths without apparent cause, the sugar tolerance test may indicate that the patient is a potential diabetic. Nevertheless, with the diagnosis established, the management of a pregnant diabetic is the same as the none-pregnant patient, with the exception that some men feel that perhaps premature birth gives the infant a little better chance.[13] There is not much doubt but that insulin has rendered the diabetic mother a great deal safer in pregnancy than formerly, but whether or not it gives us more live babies is questionable.

In concluding, I wish to merely mention a few additional points that are important in the management of diabetes. Appropriate treatment should be emphasized in the care of the surgical or the infected diabetic patient, for here the use of insulin and dietary measures are most important in combating the formation of ketone bodies.

Exercise is a factor which must be strongly considered in adjusting a diabetic patient, because of the active metabolic state of glycogen in the muscles. A mild diabetes may seem quite severe in a patient who for some reason or other must be very inactive temporarily.

Beware of the use of glandular pills and quack preparations in the treatment of diabetes. The only preparation thus far effective in this disease is insulin hypodermicly administered.

I have not discussed specifically the treatment of diabetic children because that in itself is a large subject; however, the principles are the same, except for the important additional factor which we must keep in mind, namely, that children are growing. As Joslin has said, "The diabetic child is still our teacher, and it is because after all these

(Continued on page 230)

Present-Day Relief of Prostatic Obstruction*

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FEW phases of medical care have undergone such pronounced changes during recent years as the treatment of prostatic obstruction. Whereas in the past patients having this condition were confined to the hospital for weeks and perhaps months and, in the large majority of cases, were subjected to two operations with a definite risk accompanying each operation, at the present time the treatment has been materially changed, greatly to the advantage of the patient. As with any new measure in medicine, the transurethral treatment of prostatic obstruction is decried by some, who say either that it cannot be done except in the small median bar type of prostate gland or that end results will not prove to be satisfactory. The former criticism has proved to be invalid according to experience at the Mayo Clinic.

Regarding the ultimate results, perhaps there may rightly remain a certain degree of uncertainty, as this type of treatment is too recent an innovation to permit the following of a large series of cases over a long period of years. From present indications, however, we have reason to believe that satisfactory permanent results will be obtained in the large majority of cases. Be that as it may, if I were the patient, I should much perfer two or three resections, if necessary, rather than a two-stage prostatectomy. The technical difficulties of transurethral prostatic resection are such that one unfamiliar with the detailed local anatomy and transurethral manipulative procedures in general will labor under a great handicap in attempting this type of operation. Once these basic requirements are acquired, the scope of usefulness and gratifying results from this form of treatment multiply rapidly, as shown in table 1.

TABLE 1
SURGICAL TREATMENT OF PROSTATIC HYPERTROPHY

Year	Patients Having Prostatectomy	Patients Having Transurethral Resection
1930	85%	15%
1931	29%	61%
1932	12%	88%
1933	2%	98%

Only gradually, and as results justified, did transurethral resection replace prostatectomy as the routine operative procedure for treating hypertrophy of the prostate gland at the Mayo Clinic, changing from 15 per cent in 1930 to 98 per cent in 1933. Perhaps the pendulum has swung too far toward resection during the past year, but, as yet, there has been no reason to regret this tendency.

With the change in operative procedures, other changes in the treatment of patients have also been made and, because of this fact, consideration will be given mainly to patients treated during 1932 and 1933. During this period, 789 resections were performed with a mortality of 0.63 per cent (tables 2 and 3). There were only thirty-eight prostatectomies performed during this same length of time. Less than a dozen patients were denied operation during these years and these because of advanced disease elsewhere in the body which, in our opinion, shortened the expectancy of life to a few months. Further, during 1933 only 14.4 per cent of patients had a two-stage operative procedure . This includes both those who had more than one resection as well as the group in which preliminary cystostomy was performed prior to resection. The average period of postoperative hospitalization was approximately seven days. The length of time required in the hospital prior to operation varied with the indi-

TABLE 2
PROSTATIC SURGERY FOR THE YEAR 1933*

	Cases	Percentage of 451 Patients
Patients subjected to resection	451	...
Resections performed	513	...
Prostatectomy performed	7	1.5
Patients subjected to resection in two stages or more	38	8.4
Patients subjected to cystostomy at the clinic prior to resection	28	6.2
Patients subjected to resection following previous prostatectomy at the clinic	3	0.6
Patients subjected to resection following previous punch operation at the clinic	19	4.2

*789 resections during 1932 and 1933 with mortality of 0.63%.

TABLE 3
CAUSES OF ALL DEATHS FOLLOWING TRANSURETHRAL RESECTION DURING 1932 AND 1933

Cause of Death	Age, Years	Days Following Resection
Bronchopneumonia (two cases)	85 and 67	21 and 23
Cystoureteropyelonephritis and septicemia	81	23
Calcareous aortic stenosis and acute pyelonephritis	76	26
Bilateral pulmonary embolism	67	12

*Read before the Aberdeen District Medical Society, Aberdeen, S. D., January 9, 1934.

†Division of Surgery, The Mayo Clinic.

vidual patient, depending on whether preliminary treatment was necessary or not.

Applicability of Resection—The selection of patients suitable for transurethral resection may be considered from an anatomic or a clinical point of view. Anatomically, certain urologists feel that the gland that causes obstruction mainly by intraurethral enlargement of the lateral lobes is unsuited for resection. Undoubtedly this is the type of gland that is most difficult to resect. However, satisfactory results can be obtained by this type of treatment in these cases, although if prostatectomy is to be performed in any group of cases, this is the group in which it would be most desirable, for resection is a long and tedious process and occasionally it may necessarily be performed in two stages. Glands presenting hypertrophy mainly of the median lobe yield most readily to transurethral methods. Those having moderate sized enlargement of all three lobes are likewise very readily resected.

Clinically, relief of prostatic obstruction by resection can be afforded many patients previously denied the opportunity of prostatectomy. These patients fall mainly into two groups. The first group comprises patients who are particularly poor risks because of extensive renal injury, an impaired cardiovascular system, advanced senility or because of debilitating organic disease. In this group suprapubic prostatectomy presents a prohibitive risk. In the second group are those patients who have malignant disease of the prostate gland, perhaps with distant metastasis; they are particularly benefited by present-day methods of treatment. Whereas in the past these individuals were doomed to repeated catheterization, or else a permanent suprapubic cystostomy, now normal vesical function can be restored by resection in almost every case, and as a palliative procedure resection is a boon to these unfortunate patients. The surprisingly slight amount of postoperative reaction following transurethral resection permits employment of this treatment under most adverse circumstances.

Preliminary Treatment—Although the risk attending properly performed resection is slight, results would be far less satisfactory if care were not exercised in preoperative treatment. This does not mean that long periods of preliminary drainage are necessary in the average case, as in former days, but sound clinical judgment must be utilized in selecting cases in which a certain amount of preoperative preparation is required. During 1933, approximately 50 per cent of the patients subjected to transurethral resection at the clinic had no preoperative preparation other than that accorded any surgical patient. Approximately 40 per cent of the patients were provided with preliminary drainage by an indwelling catheter for several days. In an additional four per cent intermittent catheterization was employed, and the remaining six per cent were subjected to prolonged drainage by suprapubic cystostomy.

Preliminary drainage may be indicated to reduce infection in the urinary tract or to improve renal function. If the urine is relatively clean and if renal function, as evidenced by the value for urea in the blood is within normal limits, preliminary drainage is of no particular benefit. If, on the contrary, there is a large amount of pus in the urine and the value for urea in the blood is markedly elevated, drainage of one type or another is of value. An indwelling urethral catheter provides the method of choice in the usual case. If there is diffuse infection in the urinary tract and the value for urea in the blood is more than 100 mg. for each 100 c.c., and if the prostate gland is greatly enlarged, suprapubic drainage is usually desirable. If under the same conditions the prostate gland presents only moderate enlargement, resection often may be performed, after preliminary drainage with a catheter, with less risk than that which accompanies suprapubic cystostomy. Intermittent catheterization is employed occasionally when the indwelling catheter is poorly tolerated and the patient has been accustomed to self-catheterization. During the course of preliminary drainage, if this is instituted, a generous supply of fluids, plenty of nourishment, moderate physical activity, and attention to the general physical condition are beneficial.

Operation

Technic—There are almost as many different technical appliances and methods for performing transurethral resection as there are surgeons employing this type of treatment. Many of the arguments for or against one method of procedure as compared with another often appear foolish and futile, and the primary consideration should be the relief afforded the patient. After trying various instruments, the Braasch-Bumpus resectoscope has been chosen at the Mayo Clinic as the most desirable. I am certain other surgeons obtain excellent results with different instruments. A consideration of more importance is the capability of the surgeon performing the resection.

An accurate appreciation of the anatomic landmarks is essential. If manipulations are kept within the triangular area outlined by the ureteral meatuses and verumontanum, the chance of injuring the external sphincter on the one side or the vesical wall on the other is relatively slight. In

remodeling the vesical outlet to relieve prostatic obstruction the aim, in brief, is to establish a smooth, cone-shaped channel, the apex of which is at the verumontanum and the base directly continuous with the vesical wall toward the trigone. If this is accomplished, all the obstructing tissue will be removed. This may often weigh 40 or 50 gm. or more. Besides the care exercised in avoiding injury to the external sphincter and the wall of the bladder, equal diligence must be used in securing complete hemostasis. This can be readily accomplished by electrocoagulating individual vessels with the Bugbee electrode. If spinal anesthesia is employed, which is usually the anesthesia of choice, and if the blood pressure falls to any considerable degree, it is advisable to administer a stimulant, such as ephedrin, in order to re-establish normal pressure prior to conclusion of the operation. If precautions of this type are observed, postoperative hemorrhage of any magnitude is less than two per cent. It is advisable that an indwelling catheter be left in place for forty-eight hours following resection.

Post-Operative Care

Among the more important factors in the postoperative care of these patients is avoidance of clot formation in the bladder. This is accomplished, first, by controlling all appreciable bleeding at the time of operation and, second, by irrigating the bladder through the indwelling catheter as often as necessary during the first twelve to twenty-four hours following resection. This may mean irrigation every twenty minutes, or every four or five hours, depending on the amount of bleeding present. In order to avoid infection, the indwelling catheter should be connected to a sterilized corked bottle, establishing a closed system of drainage which is never disturbed except under aseptic precautions.

Forty-eight hours following operation, the indwelling catheter is removed, as a rule, and the patient is permitted to get out of bed. Subsequently, a daily check of residual urine is of value, as incomplete emptying of the bladder during this period predisposes to infection and absorption of toxic material from the operative site. If more than 100 cc. of residual urine is found, it may occasionally be desirable to reinsert the catheter for a day or two until subsidence of edema and local postoperative reaction permit complete emptying of the bladder.

Persistent postoperative residual urine is usually caused either by an atonic bladder with a decompensated musculature resulting from prolonged obstruction, or by the presence of obstructing prostatic tissue unremoved at the time of operation or subsequently pressed into the posterior urethra. The decompensated bladder is rehabilitated almost without exception by the use of acetylcholine and further urethral drainage. If residual urine persists and the tonus of the vesical musculature is adequate, a second resection may be necessary. This may safely be performed, in the usual case, about ten days following the initial operation.

Complications—Complications following transurethral resection are far less frequent than after prostatectomy. It is unusual to observe more than one degree elevation of temperature following resection. Should unexpected hemorrhage occur, it is a simple matter to electrocoagulate the bleeding vessel. Epididymitis is uncommon and can be completely avoided by ligation of the vas deferens. It is a safe policy to ligate the vas as a routine procedure in all patients over seventy years of age, and also in any patient who is considered to be a particularly poor risk. Urethritis and periurethritis may be obviated by not using an instrument of too large caliber for the individual patient and by not causing undue trauma to the urethra at the time of operation. Postoperative urethritis and periurethritis usually subside readily with the use of warm sitz baths and urethral irrigation. Pulmonary embolism may occur occasionally despite all precautions. Confinement to bed for only forty-eight hours postoperatively, encouragement to move the arms and legs around while still in bed and, at times, the administration of thyroid extract, aid in warding off this tragic occurrence. Strict observance of aseptic precautions, adequate urinary drainage, a generous supply of fluids, agents to acidify the urine, and urinary antiseptics are all helpful in preventing chance complications from infections.

Comment

Transurethral prostatic resection is, if performed by a surgeon familiar with this type of work, a sane and safe procedure for the relief of prostatic obstruction. Technically, it affords difficulties not encountered in prostatectomy. Many men have contributed to its development, not the least important of whom have been those responsible for the ingenious electrical and mechanical devices so necessary in its application. The numerous advantages, such as lowered mortality and morbidity, shortened hospitalization, wider range of applicability, excellent results, and lessened discomfort to the patient, combine to render this procedure one of the most worthwhile innovations of recent years.

"Causes of Mental Disorders"

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IN A study of a person with a mental disorder and here I use the term in its broadest sense, we can appreciate certain abnormalities of conduct, which we meet in persons who are not in the legal sense insane. We must remember that while all personalities are the outgrowth of primary instincts, not all persons become insane. In other words, while the study of the unconscious mind may give the explanation to an individual's conduct, it does not always lead to the solution of the question why one person becomes insane and another does not.

In that group of mental disorders known as the Psychoneuroses, the study of the unconscious life gives us the greatest assistance in determining the cause of the disorders, as well as the explanation of the symptoms presented; to illustrate this more clearly, take a group of cases, those dependent on infectious disease, syphilis, for example. Syphilis produces mental disease in about one out of every twenty infected. Why all syphilitics do not develop mental disease is a question we cannot answer, but why one syphilitic mental disorder leads to a state of depression and another to a state of excitement or mania, is a question we must answer. For the answer, we must search through the mechanism of the unconscious mind, through instinctive life, through personality. In other words, frequently we are presented with a mental disorder for which we can easily ascertain the direct cause, but to understand the "why and wherefores" of certain symptoms of that particular mental disorder, we must search more deeply into the individual's past, to follow backward the path along which the personality has come to its present growth.

This brings us to the necessity of considering some of the causes of mental disorders. It is of the greatest importance that something should be known of these factors in the production of mental disease, as well as those originating in the unconscious mind. Actually a knowledge of both sets of factors are important, as one supplements and coexists with the other.

Much importance hase been attributed to heredity as the cause of mental disease. No doubt in the popular mind, it is the most important. I do not wish to go into the theoretical considerations of heredity. Although we are not certain of how it works, we can say that heredity is of great importance in the causation of mental disorders. That the germ plasm is affected disastrously is seen from the fact that we find various debilitating diseases in the parents of persons with mental disorder, the most common of which are tuberculosis, alcoholism and syphilis. Some forms of mental disorder seem to be definitely hereditary; I may mention Huntington's chorea, feeblemindedness, dementia precox, manic depressive psychosis and epilepsy. No two feebleminded individuals ever produced a normal child.

It is convenient to divide these specific causes into two main groups according to their nature and manner of action—physical and mental. Each of these groups is subdivided according to special features. I will first consider the groups which I have designated as physical. First here we meet with a series of causes which we may call toxic, this is again divided into exogenous and endogenous. That is, the first comprises those causes which are original outside the person such as alcohol, drugs and infectious diseases. The endogenous include those from some physical disease, primarily originating from the individual. The distinguishing line between these two groups is sometimes vague but is practically of some importance.

Although alcohol is a drug, and syphilis an infectious disease, because of their exceeding important role they merit particular and separate consideration. For several reasons alcohol and syphilis constitute two of the most important specific causes of mental disease. In the first place alcohol and syphilis affect not alone the individual but cause the transmission of a weakened germplasm to the children. It is most common to get a history of alcoholism in one or both parents of mental cases. Syphilis is frequently the cause of feeblemindedness. Dementia paralytica and locomotor ataxia are syphilitic diseases of the nervous system. In some eastern states alcohol alone is responsible for from 15 to 20 per cent of all causes of mental disorder admitted to our hospitals for the insane. It is safe to say that one-quarter of the population of the eastern state hospitals are due to alcohol and syphilis. In one year in New

York state dementia paralytica caused more deaths than were caused by typhoid fever, 1,000 dying from typhoid fever and a larger number dying from syphilis of the brain.

Morphine, cocaine and other drugs are often the cause of a psychosis.

Of other toxic causes which we may mention are tuberculosis, typhoid and influenza. Many other diseases might be added to this group.

The causation of mental disorders, as a result of glands of internal secretion especially the thyroid and ovary, is becoming more and more recognized. It has long been known that lack of function of the thyroid leads to dwarfism and feeblemindedness. In hyperplastic goiters we find the state of excitement known as thyroid crises which are a sign of mental abnormality. Also it has been known that certain definite mental changes occur where the sexual glands are not properly functioning. For example following the surgical removal of the ovaries or at the change of life certain definite mental and nervous symptoms appear.

Trauma injury, as a cause of mental disorder, is met with in adults and more especially in infants. Injury to the head during birth leads to feeblemindedness.

Exhaustion from debilitating diseases of chronic course is a cause of mental disorder. Incidental factors here are unsanitary hygienic living conditions, poor and insufficient food and the like.

There is a popular belief that mental disease often follows pregnancy. This is to a degree true, but the causation here is complicated. Pregnancy is often not the single cause but an inciting factor in a person already predisposed to mental disease. In other words the pregnancy has been but an accidental and incidental cause. Infection following pregnancy may be a cause of mental disorder but here again it was not the pregnancy itself which caused the psychosis but rather the infection which was but the accidental accompaniment of pregnancy. A normal pregnancy in a normal individual is never the cause of mental disorder. The fatigue, the exhaustion, the loss of blood or the infection associated with pregnancy may serve to bring about a mental upset.

We come now to a consideration of the second main group of causes of mental disorders, the mental as opposed to the physical. They are individual, personal. They involve fundamentally the individual mind and its reactions. This we have seen is largely a matter of the instinctive life, the unconscious. There are, however, certain outstanding features, certain external factors which enter into a modification of the personality, factors so intimately connected with the beginning of a mental disorder that they may in a way be looked upon as the cause of it.

Of these apparent causes sudden shock or chronic worry and anxiety are, in the popular mind at least of great importance. We must ask first, what is it in a person's makeup that makes it possible for shock or worry to produce a psychosis? Why is it one soldier develops a psychosis under fire and another does not? Why is it that one person will worry himself into a psychosis and another person under similar circumstances will not? The same cause acting upon two persons produces different effects. It is obvious then that it is not so much the shock or the worry which is at the bottom of the psychosis as it is something in the individual mental makeup. The shock and the worry become only the accessory apparent causes, the factors which bring about in the one an unfavorable mental state, a psychosis.

Imitation and suggestion do not play a large role in the causation of mental disorders outside of certain of the psychoneuroses, such as hysteria, psychasthenia and the like.

Education at home is what we ordinarily term "bringing up." It begins at the earliest age and continues during that period when our earliest experiences are being associated and assimilated into the vast unconscious mind. It is in other words the period of childhood. The attitude of the child towards the parents is but the reflection of the parent's treatment of the child. During this early period the parents are the example for the child, what they do is what the child attempts to do. Wrangling and disagreement at home furnish poor material for childhood mental growth. With the best of intentions parents often fail because they do not understand the child's mind, are ignorant of its mode of growth and development, cannot see from the viewpoint of the child. The field of child psychology is too large for us to endeavor to more than touch the surface.

There are other factors which have much to do with one's mental equilibrium. These are of general nature and of them we might mention vocational selection, civilization, marriage ,etc. Throughout life our efforts meet with success and failure in varying proportion. A proper balance of these extremes is essential to normal mental activity. Continuous failure kills the desire to do, lowers energy and ambition to go ahead. Success is stimulating and healthful. For this reason vocational selection is important. One must not try to attain so far that failure is inevitable. Overstepping one's resources leads to failure. If the aim is too high the goal will not be reached. To some occupations some individuals are not at all suited

and for them to attempt them must result in failure. What is food for one is poison for another, an old saying which fits well here.

We hear much nowadays of the stress of modern life, hard work, etc., as causes of mental disorder. The pressure of activity, the demands and stress of today's existence, civilization as we know it, may be indirectly responsible for some mental disorder but fundamentally such mental disorder results from the inability of the individual to fit himself, to adjust and adapt himself, to his environmental requirements. Hard work alone never produced mental disorder in one not originally predisposed of it. The hard work itself becomes but an accessory cause, effective upon a fertile soil of mental instability.

In the last analysis then we find that all of these causes which we have grouped as mental are but accidental and accessory. They are the apparent causes. They are distinctly not physical or organic and perhaps it is largely for this reason that we call them mental. They can only become active in the production of mental disorder where the individual mind is of such makeup that they find placement and soil upon which they may thrive. Again we back up to the individual, the particular mental mechanism, the personality, which can be touched off in its abnormal course by these secondarily exciting factors. In conclusion we must again emphasize that it is the individual constitution which counts as the prime factor in the causation of mental disorder. It is this factor which we must study closely in order that we may understand how it is that secondary factors may act to produce mental disease.

LABORATORY DIAGNOSIS OF AMEBIASIS

(Continued from page 220)

to four clearly visible nuclei and one or two refractile, bar-shaped chromatoid bodies. The cysts of endamoeba coli are larger, contain from one to eight nuclei and in cysts containing less than eight nuclei present brown-stained glycogen masses. The active entamoeba histolytica is about twice the size of a pus cell. When temperature precautions have been observed it is found to be very actively motile. This active motility and its ability to ingest red blood cells at once distinguish this organism from the E. coli with which it is most apt to be confused.

From the standpoint of prevention it is essential that all infected individuals be controlled Amoeba histolytica is only infectious in its cystic stage. These cysts may persist in patients whose active symptoms have yielded to treatment. For this reason feces should be examined on several successive days following cessation of treatment and every two or three months thereafter for a year.

For the detection of cysts in suspected carriers feces should be examined within one-half hour after they are passed. A portion of feces about the size of a large pea should be thoroughly emulsified in 25 cc. of 0.9 per cent sodium chloride solution. The large particles of feces can be removed by straining through gauze. The strained material should then be centrifuged at high speed for several minutes and the resulting sediment distributed on several slides and mixed with an equal amount of the Donaldson's iodine-eosine mixture and cover slip applied. The whole field should first be studied with the low (x100) lens. Yellowish spots on a reddish background should be sought and examined under the high dry lens. In this way, if cysts are present, they are most apt to be found and identified.

THE PRACTICAL MANAGEMENT OF DIABETES MELLITUS

(Continued from page 221)

years of interest in diabetes I have more than twice as many diabetic children alive as dead that I am confident of the future."

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The Place of Student Health Work in the Educational and Medical Scheme of Things*

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A STUDY of the 1078 colleges, universities and professional schools of the country would show their student health services organized upon bases as far apart in general principles as the two poles—some providing only an administrative organization and depending almost entirely upon the general practitioners of the community for the actual medical work—some providing college physicians to take over the complete medical and surgical care of their students and using the general practitioners of the community little or none at all. Nothing we say here will be likely to change the policy of those institutions already well organized on either one of these diverse bases. When, however, institutions contemplating the organization of a student health service look to us for advice we might as a group be able to aid them in making a logical approach to the problem. And I offer the following line of reasoning as a tentative means of approach to the general question *How Can Student Health Service Best Fit into the Educational and the Medical Scheme of Things?*

Of approximately one hundred twenty-three million persons in the United States, nearly twenty-six million are children in our public elementary and secondary schools; two and one-half million are in attendance at our private elementary and secondary schools; and one million attend our colleges and universities.

The Problem in the Public Schools

The twenty-six million children who are in attendance at our public elementary and secondary schools are largely living at home. In this group, minor illnesses can be most effectively treated in the child's own home and major illnesses made a care of the community's general hospital. Since the parents are available there is no reason for the school to consider itself "in loco parentis," and there is no reason why the school should necessarily feel that it must maintain a pretentious medical service and infirmary. If, however, the parents of these children, as taxpayers, prefer to shift the medical care of their children to the school and pay for it in school taxes, such an arrangement is perfectly feasible though the question might well be raised by the taxpayers who have no children as to why they should be taxed not only for the education of their neghbor's children, but for their medical care as well. Unless we are contemplating revolutionary changes in our system of medical care, the logical scheme would seem to be in most instances, to place as much responsibility upon the home, the family physician and the community medical facilities as they will carry, (certainly the *treatment* of all illness, almost as certainly the preventive and educational activity of the *periodic physical examination*) and leave for the school budget only those medical activities which are residual and at the same time preventive and educational, (health teaching, health habit training, efforts to control communicable disease and efforts to speed up the process of remedying remediable defects). For this large group of pupils who live at home, then, the provision of a pretentious school health service is to be looked upon either as a luxury to be provided by special funds or as an experiment to determine the advisability of the community's taking over of the medical care of their children as well as their education.

The Problem in Our Colleges and Universities

When we consider the little over a million students of the country who are in attendance at our private secondary schools, and our colleges and universities, we find, however, quite different conditions and must arrive at quite different conclusions. These students as a rule come in from a distance, oft times even from foreign countries, they have no home to retire to in their minor illnesses, their parents are not available to advise them, they have no private physicians to whom they would naturally turn in time of illness. The institution that receives their tuition is obviously, though sometimes not admittedly "in loco parentis." Certainly under such circumstances the institution is morally obligated to do considerably more than is demanded in the public school group. Some system has to be provided whereby the institution is kept continuously aware of the

*Presidential address of the American Student Health Association, Chicago, Ill., December 28, 1933.

state of health of its students and can assure itself that in each case of communicable disease proper measures are being taken to prevent spread. To meet these requirements in the simplest way demands: (1) The maintenance of an institutional infirmary to provide at least for those students too ill to be in their dormitory, yet not ill enough to justify the expense of care in the community hospital. (2) The organization of a student health service sufficiently staffed at least to examine each student at entrance, carry on necessary communicable disease control measures and keep track of the student illnesses to the extent of seeing that reasonably good medical care is provided.

Having of necessity, gone thus far in providing for the medical care of the student body, it is just at this point that the greatest diversity of opinion arises. If the institutional authorities and physician are but little impressed by the assertion that leaving the medical care in the hands of the practicing physicians of the community will stimulate those physicians to their best efforts and will put the students in the most receptive frame of mind to accept the advice given, they will very likely expand, the moment expansion from this is possible, in the direction of providing complete medical care for the student. This, it seems to me, is a mistake. Nothing is more pitiful than to see one lone health service physician attempting complete medical care for a large student body. The first move in expanding from the minimal program of infirmary care, entrance examination, communicable disease control and recording of student illnesses, should be, in my opinion, in the preventive and educational field, rather than in the therapeutic, and it should include an *annual* physical examination, an *annual* health-habit inventory, medical advice for minor and incipient illness and the teaching of the essentials of personal and community hygiene.

If, however, these educational and preventive needs have been adequately met and there are still funds available for expansion or the institution finds itself in possession of a medical staff, as for instance its medical college teaching staff, fully equipped to take over the complete medical care of the student body, I fail to see any serious objection to this procedure. The experience of the Universities of California, Michigan and Minnesota furnish ample evidence that under proper conditions the complete medical care of the student body can be successfully taken over and carried on by the institution itself and with no obviously unfavorable effect upon the physician-patient relationship. The utilization of the practicing physicians of the community with appropriate compensation, to supplement the full time staff has proved practical in several of these organizations.

School and College Health Service and the General Practitioner

Early in the organization of the system of universal schooling in this country, it became evident that health protection and promotion had to be made a matter for special provision since, in the absence of such provision, communicable disease became an almost continuous menace. The logical agents to do this work were the physicians, but, strange to say, the medical profession as a whole tended to stand aloof and even tended to brand school health service work as a form of pernicious contract practice. The physical education profession was, however, quick to see the need for health specialists in the schools and so well did their training schools do their job of turning out teachers that before many years they practically occupied the field.

Whether this situation is as it should be can be argued but the fact remains that the big job of providing a really adequate annual physical examination for the more than twenty-six million children in our elementary and secondary schools still remains to be done. The physical educators cannot do it, the few school physicians cannot do it, and the responsibility lies squarely on the shoulders of the general practitioners of the country. If they do not soon show more interest in the project than has been evident in recent years, the schools will almost be forced to organize health services of their own in order that health practices be not permitted to fall too far behind health teaching.

In the meantime, we find certain members of the medical profession criticising the efforts of colleges and universities to meet their health responsibilities through the operation of student health services. If the medical profession was already doing a good piece of health work among the twenty-six million public school children and was casting about for more worlds to conquer, criticism of the college health service among the one million students on the basis of its taking away private practice might be justified. But such is obviously not the case since probably less than ten per cent of the twenty-six million school children are receiving adequate annual health servicing at the hands of the general practitioners. It is at least questionable, too, whether the general practitioners of a college community have

any " a priceri" rights to the medical practice of the college students who are not of that community but come in from a distance only for the college year. Certainly the right of an educational institution to use its own medical college staff to carry on a student health service is beyond question.

In conclusion then, may I summarize as follows: (1) The physician-patient relationship as ideally found in the private practice of medicine is extremely valuable and every effort should be made to preserve it. Among the reasons for subscribing to this belief, two are perhaps most important: First, the right of the patient to terminate promptly the services of the physician if those services are not satisfactory is, in most instances, a potent and self-operating device for protecting the patient against inadequate medical care; second, the patient who chooses his physician and pays him directly for personal services rendered, is more apt than not to value and, therefore, respect and follow the advice thus sought.

(2) We should continue to make the private practitioner of medicine the key man in the medical care of the children in our public schools but the practitioner should be making much more definite efforts to fill this important place adequately.

(3) In the majority of our colleges and other institutions of higher learning where funds are limited and no medical college staff is easily available, an institutional health service and infirmary should be definitely provided but the emphasis should be placed first upon the health educational and preventive phases of medical work (such as communicable disease control, annual health examining, medical advice for minor incipient illness, and hygiene teaching) and much of the strictly therapeutic work such as that of the surgeon, internist and ophthalmologist should be referred to those physicians and specialists practicing in the community.

(4) In those universities provided with ample funds for the purpose or with a medical college staff available, the provision of complete care for the student body in addition to the usual health educational and preventive medical facilities, is both practical and proper and the pioneer experience of these institutions in this new field of organized medical practice should be watched by all of us with the greatest interest.

(5) The development of school and college health services in medical hands and along the conservative lines indicated, will meet a very real educational need and will provide for the medical profession an opportunity for even greater service. Let us hope that the medical profession will throw off its fear of treading new paths and cooperate whole-heartedly with the educational authorities in this important venture.

The
JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA, *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

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South Dakota State Medical Association
The Hennepin County Medical Society
The Minnesota Academy of Medicine
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North Dakota State Health Officers' Assn.
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W. A. Jones, M.D., 1859-1931 — W. L. Klein, 1851-1931

MINNEAPOLIS, MINN., APRIL 15, 1934

RESPECTFULLY SUBMITTED

The voluminous report of the superintendant of the Minneapolis General Hospital to the Board of Public Welfare, January 30, 1934, strikes the unbiased reader as more argumentative than reportorial; argumentative in tone rather than in content we would say.

Apparently in an effort to entertain by figures of speech, an amusing picture of the present plight of the medical profession is painted. One paragraph starts out with this oracular statement: "Organized medicine is ill." Lest there might be some misunderstanding or exceptions, the report goes on to say in all-inclusive phraseology: "The medical profession is ill. The individual physician, be he general practitioner or so-called 'specialist' is ill." Symptoms and complaints are facetiously discussed and therapy alluded to by chance. The reader is "referred to Webster for a definition of 'inanition.'" Mention is then made of "lowered income" with the following comment: "This, while it causes the medically trained man to instinctively think of 'lowered blood pressure,' strangely enough appears to react oppositely upon the individual most intimately concerned." "Indeed a status of 'high blood pressure' seems to have been arrived at by the profession as a whole and by organized medicine as a group entity, though this is evidently one of the complications rather than one of the symptoms of the illness." Further we read about "such chronic ailments as 'inertia' or 'lack of co-operation' or 'absence of cohesiveness' or as the result of the presence in the blood of the profession of too large a coefficient of 'individualism.'"

After certain final recommendations, this document was subscribed "Respectfully submitted."

A. E. H.

AMEBIC DYSENTERY—A WARNING

Amebiasis is far more prevalent than is generally conceded by the majority of the physicians, and that it exists even in the northern tier of states in endemic form, should arouse special interest and watchfulness on the part of health workers and the medical profession as a whole.

The recent report[1] put out by the Chicago Board of Health and the report[2] on the "Amebiasis Outbreak in Chicago" by a special committee appointed by Dr. Herman M. Bundersen, president of the Chicago Board of Health, not only emphasizes the importance of greater watchfulness and a more careful study of cases of dysentery but even indicates the advisability of making systematic surveys of the dysentery situation in every state.

It will be remembered that most of the cases of amebiasis (of which about 800 were tabulated up to the time of the special committee's report) occurred in 206 cities throughout the United States, and that in all of these it has been established that the infection originated in one of two large hotels situated in Chicago. These hotels were exceptionally well patronized by people

from various parts of the United States and even by citizens of several foreign countries. The infection was definitely traced to an infected water supply in each of these hotels. Active cases of amebic dysentery, together with chronic (cyst) carriers were found among the hotels' personnel. That chronic cyst carriers may develop in any infected individual and menace the public just as surely and in practically the same way as does a chronic typhoid carrier, is a grave possibility. Individuals infected in Chicago are found widely scattered over the United States. It is apparent, therefore, that health boards, health workers and members of the medical profession in all communities should be on the alert to detect cases and to see that active treatment and control measures are instituted in all instances.

Recently a resident of one of the larger cities of South Dakota has been identified as a sufferer of amebic dysentery. Her infection was traceable to one of the two Chicago hotels implicated by the Chicago Board of Health.

This patient, a young woman at the University of South Dakota, was in Chicago the latter part of August and on various occasions dined at one of these hotels. Her first symptoms developed several weeks after she had returned to her native state and following her enrollment in the University. From the first her symptoms were mild, consisting of alternating days of illness and days of apparent good health. The symptoms consist of comparatively moderate diarrhea with a discharge of soft, unformed, blood—and mucous-streaked feces, some tenesmus and lassitude. She early consulted the "family" doctor, one of the outstanding physicians in South Dakota. Early laboratory study failed to establish the identity of her sickness and she was referred to the writer for the purpose of making additional laboratory tests. These tests were conducted in the State Health Laboratory situated on the campus of the University. This facilitated the procuring of material for examination under ideal conditions. Examination of the feces was made during the height of the dysentery symptoms. Fresh specimens of feces were obtained, placed in one of the large incubator rooms where the microscopic examination was also conducted. From specimens of bloody, mucoid material numerous active amebae containing varying numbers of erythrocytes were discovered. Of interest in this connection is the fact that the ameba under these conditions remain active for several hours.

The finding of a case of amebic dysentery, the origin of which is traceable to a Chicago hotel, dramatically emphasizes the warnings concerning the danger of the wide spreading of this dread disease issued by the Chicago Board of Health, the American Public Health Association, the American Medical Association and similar agencies. It should arouse active, alert interest on the part of all interested in the promotion of public health, living in this region.

Any case of dysentery which does not clear up readily should be thoroughly studied under the best possible conditions and all cases of this nature in which there appears to be a definite connection with the Chicago origin of the disease should be considered as amebic dysentery until definitely proven otherwise. J. C. O.

1. Bundersen, Tonney and Rawlings: J. A. M. A., February 3, 1934.
2. Ibid.

REFRESHING CHANGE

One of the delights of practicing medicine in this area comes from the variety of diseases encountered.

With the changing seasons, there is an annual turnover of diverse, even though recurring ailments, that takes away the monotony of routine work met with in more equable climes. *"Eine alte geschichte doch bleibt sie evig neu."* And as it comes anew, it is like an old serial story whose preceding chapters one is familiar with, but which has been laid aside for a rest period, so to speak. Its further unfolding is looked forward to with interest. In the interim there is time for that sadly neglected art of contemplation, meditating on the lessons of the past. There is an eagerness to apply their teachings as well as those of any recent discoveries that may have been announced in the intervening period, to the next epidemic as in chronological order it is sure to come along.

Variety is said to be the spice of life, and those who like a little seasoning as they wend their way, will find it here in refreshing abundance.

A. E. H.

THIRD VENTRICLE TUMORS

In a recent monograph* Dandy has elaborated and brought down to date the observations of benign tumors in the third ventricle which he presented in abstract form at the meeting of the American Neurological Society in Atlantic City, N. J., on June 7, 1932. This study is based on his own operative experience in 21 cases and on a survey of the 47 cases in the literature which came to postmortem without previous correct diagnosis or operation. He divides them into two general groups: (1) colloid cysts, of which five occurred in his series, and (2) other primary benign tumors, comprising the remaining 16

cases in his series, covering a variety of types but excluding the "numerous cerebral gliomata, hypophyseal duct cysts and pineal tumors, all of which grow into the third ventricle."

As to age incidence, the colloid cysts are rare before the twentieth year and most frequent between the ages of 20 and 40. The other types, in his experience, are much more common between the ages of ten and twenty. Sex seems to make no difference.

Dandy has made a careful study of the signs and symptoms in his 21 cases. The first complaint was headache in 70 per cent but he remarks that "the high incidence (30 per cent) of other complaints of varied character shows the necessity of suspecting tumors of the third ventricle in the absence of headache as a first symptom." Yet none of these, or any sequence or grouping of them, is definitely localizing or more than suggestively diagnostic. He says that "the most promising are: (1) loss of pupillary reflexes; (2) intermittent attacks of various kinds, (a) headache, (b) dizziness on changing position, (c) bilateral motor and sensory changes, (d) loss of vision; (3) perhaps loss of high tones in hearing (audiometer curve); (4) bilateral ptosis and ophthalmoplegia." None of these, he says, except perhaps (1) and (4) is more than suggestive of the tumor's location, and the exceptions only indicate the location to the general region of the quadrigeminal bodies.

He then goes on to say that tumors of the third ventricle are "easily, safely and unequivocally diagnosed and localized by ventriculography." Coming from this source, this view should receive very earnest consideration. It fits in well with what has been already stated in these columns on the propriety of using ventriculography only in those cases "in which the localization of the tumor is impossible by clinical means or in those where serious doubt exists regarding the correctness of the clinical localization."†

Dandy's mortality rate in these 21 cases, covering a period of eleven years, was 33.3 per cent, but in the past 2½ years fourteen of these tumors have been removed with a mortality rate of 14.3 per cent. The results in the patients who recovered were very satisfactory indeed.

We may regard this contribution of Dandy's as highly important. It marks the reaching of another milestone in brain surgery. To be able to diagnose accurately and remove with good after-results tumors hitherto considered inoperable by reason of their inaccessibility is a real step in advance. Dandy's book should be read by all, for while real brain surgeons are few and far between we must know about these things.

G. C.

*Dandy, Walter E., Benign Tumors in the Third Ventricle of the Brain: Diagnosis and Treatment. Charles C. Thomas, Springfield, Ill., Baltimore, Md.

†JOURNAL-LANCET, Editorial *Ventriculography*, December 15, 1933, p. 686.

Proceedings of the Minneapolis Clinical Club

REGULAR MEETING, FEBRUARY 8, 1934

Vice-president, Dr. Willard White, in the Chair

NEW IDEAS IN DIABETES

DR. ARCHIE BEARD

Within the last year three new ideas were brought forward in diabetes mellitus. It seems that diabetes may be a disease of metabolism only as an end result and that it should be considered principally a disease of endocrine disorder. One of the main features of this discussion in endocrinology, from both the physiologist's and clinician's standpoint, is the effect of one gland of internal secretion upon another. It is because of this probable relationship between the pancreas and the hypophysis (especially the latter) that this field has been investigated.

Dr. Priscilla White presented some interesting facts in her work with diabetic children. She has shown that most diabetic children are taller than normal children, or, in other words, they are subject to skeletal overgrowth. It is a known fact that a juvenile diabetic is on an average 2.2 inches taller than his normal contemporary. From an x-ray standpoint these children generally show an earlier ossification of their epiphyses than do normal children. As a result there has been considerable discussion as to the possible hyperfunction of the pituitary gland in diabetes. It has been shown that glycosuria occurs in from 25%-40% of all cases of acromegalia. At the present time diabetes is thought to have a definite relationship to the pituitary gland. The skeletal overgrowth in gigantism, which occurs in acromegalia, associates another clinical observation with the juvenile diabetic.

For years we have considered that a pituitary dysfunction is responsible for some cases of obesity. Joslin maintains that all diabetics over the age of 40 generally show an increase of from 25-150 pounds in weight over normal individuals one to five years before glycosuria develops. He has shown also that 77% of 1,000 diabetics were overweight either prior to or at the onset of their disease. These two factors, skeletal overgrowth of the diabetic child and obesity of the

adult, bring about a close relationship between the investigative work in this field and the facts and figures brought forth by the clinicians.

There are other factors, also, to be considered from a clinical standpoint. Physiological hypertrophy of the pituitary gland is said to occur during pregnancy. We know that pregnancy is apt to make a true diabetic's condition more serious. We realize also that diabetes is most apt to occur at the two times in life when there are marked physiological changes in the reproductive organs, or in other words, during puberty and menopause.

Clinically, we feel that the pituitary gland is greatly responsible in the disease dystrophia adiposa genitalis. Sterility is very apt to occur in the untreated diabetic. This was especially true before the introduction of iletin therapy. Within the last year the pituitary extract which has been found in pregnant women has brought in the possibility of interrelationship of this gland to other organs. From a clinical standpoint, it is believed that the parathyroid and gonads have a stimulating effect upon the insulin secretion of the pancreas and that the pituitary, thyroid, and adrenal glands have a depressing effect. The surgeon very frequently sees glycosuria in hyperthyroidism, and finds that it disappears after the operation.

The interesting and fantastic work that has been reported within the last year in cases of adenomas of these three glands, namely, the adrenal, thyroid and pituitary, presents further thought in regard to this possible relationship. We realize that the injection of adrenalin can cause a temporary increase in the blood sugar level. In some cases of glandular dysfunction in which adenomas of the adrenal gland have been found there are interesting blood sugar curves and even, at times, glycosuria. Referring back to the many cases of acromegalia with glycosuria, which we have seen for many years, it is surprising we did not give more thought before this time to the possible interrelationship of this gland to diabetes. Cushing has brought forward many facts, and in his monographic report of basophilic adenomas of the pituitary gland he has demonstrated some cases of abnormalities of the blood sugar levels. The close relationship of the liver and its glycogen storehouse to diabetes and to the other associated glandular diseases also presents some very interesting ideas.

Langerhans, in his original work, localized the cause of diabetes mellitus in the islands of Langerhans. This was accepted more or less because of the fact there were a certain number of cases in which sclerosis and pathological changes could be demonstrated in these cells. Within the last few years pathological examination of these tissues under the supervision of Dr. Joslin at the New England Deaconess Hospital has shown that a number of cases do not present any demonstrable changes in these islands. This is especially true of juvenile diabetics in contrast to elderly arteriosclerotic diabetics. Cushing writes, "It is conceivable that the oversecretion of the hypophysial substance may indirectly produce glycosuria in one of two ways: (1) by neutralizing the secretion of the islet tissue in circulation, thereby causing compensatory hypertrophy with ultimate exhaustion of the cells of Langerhans leading to the degenerative changes with which we are familiar, or (2) by actually checking the secretory function of the islets which might possibly lead to no histopathologic changes."

It has been noted that clinical improvement has occasionally occurred in the glycosuria of acromegalia following hypophysectomy. Therefore, there is some evidence to suggest that the pituitary gland may definitely counteract the internal secretions of the pancreas. Cushing and his associates found the hypophysectomized animals gradually acquire a higher sugar tolerance, and that if a large portion of the pancreas in these animals was later removed there was less disturbance in their carbohydrate metabolism than there would be in a normal animal. He has stated also that hypoglycemia brought on by the subtotal removal of the pancreas tends to subside following the removal of the hypophysis. Houssy of the faculty of medicine of Buenos Aires, in his recent lecture of June, 1933, spoke of the relationship between the hypophysis and carbohydrate metabolism. He very definitely stated that the functions of the anterior lobe are related to (1) growth, (2) sex and reproductive activities, (3) development and maintenance of other endocrine functions, and (4) metabolism of carbohydrates. He feels that the last function is the principal one of the hypophysis, and that its secretion is definitely antagonistic to that of insulin. He shows that the removal of the anterior lobe of the hypophysis increases the hypoglycemic action, and that in a fasting animal it ultimately produces death. The injection of the alkalin extract of the anterior lobe or the implantation of the anterior lobe again controls the insulin secreted from the pancreas, and hypoglycemia does not occur. In toads the removal of the hypophysis causes a decrease of liver and muscle glycogen. The animals show asthenia, and often times they have convulsions and die. However, the implantation of the anterior lobe again allows survival of these animals. Implantation of the posterior lobe has a less effective action. He shows also that injection of high doses of alkaline extract of the anterior lobe of the hypophysis for three to four days in normal dogs causes hyperglycemia, glycosuria, and ketoneuria. Both normal and hypophysectomized animals injected with the alkaline extract of the anterior lobe show a high resistance to insulin, and have increased hyperglycemic reactions to adrenalin and morphine. Hypersensitivity to insulin and phloridzin disappear after the administration of the anterior lobe extract. He, therefore, feels that the hypophysis plays a leading role in carbohydrate metabolism, but that it is not the primary cause of glycosuria. He believes it is followed in importance only by the liver and pancreas. He is of the opinion that to speak of a diabetogenic hormone is incorrect because production of diabetes is not a normal function of the hypophysis. He states, however, that the hypophysis is responsible for the hyperglycemia and glycosuria that is often present in cases of acromegalia due to an

increased secretion in the anterior lobe of the hypophysis. He considers the name contra-insulin hormone inadequate because when an animal is deprived of its pancreas its action is still produced independently of any pancreatic influence. In order that we will feel that the hypophysis is not the seat and cause of diabetes but that it is more a counteracted influence of the secretion of the pancreas, it is well to state that in his other lectures he showed the atrophy or the development of the other endocrine glands as the gonads, thyroids, parathyroids, suprarenals, and thymus. In those dogs in which hypophysectomy has occurred, at least in those deprived of the pancreas, atrophy of the parathyroid has been observed in 66% of the animals. In hypophysectomized dogs atrophy of the thyroid epithelium follows. The epithelial cells become small and flattened. Colloidal content is dense. The iodine percentage of the thyroid is increased. This iodemia is followed by an initial period of hyperthyroidism which later declines. The basal metabolic rate is decreased in hypophysectomized animals and is decreased further if the thyroid is removed. However, if the thyroid is removed first hypophysectomy does not lower the basal metabolic rate. If the thyroid is not removed and there is an injection of anterior lobe extract, hypertrophy, hyperplasia, and hyperfunction of the thyroid glands occur. He shows, also, definite relationship between the hypophysis and the suprarenals. After the removal of the hypophysis the weight of the suprarenals diminishes 38%. This atrophy principally occurs in the reticular zone in the inner substances and then progresses to the outside. He shows, also, in hyperpituitarism there is hypertrophy of the suprarenal cortex.

In conclusion, in regard to the interrelationship of these glands, it may be said that the pituitary gland probably must be considered as the master gland, and that it is not more definitely related to diminishing pancreatic secretion than it is to diminishing secretions of the other glands mentioned in the above discussion. As stated previously, the pancreas is in the position of being stimulated by the gonads and parathyroids, and lessened by the secretions of the pituitary, thyroid and suprarenal glands.

This is all that has been contributed within the last year as to possible changes in our etiological ideas in the cause of diabetes.

In regard to treatment, new ideas have been developed. Rabinowitch, a few years ago, brought forth the idea that it would be better to keep diabetic patients on a high carbohydrate low fat diet. These diets usually contain between 200-300 grams of carbohydrates and generally between 1-1½ grams of protein per kilogram body weight, or between 70-90 grams. The remaining number of calories necessary is supplied in the form of fat, usually somewhere between 60-90 grams in the daily diet. He states that these individuals are happier on this diet, and that they are apt to decrease the amount of iletin consumed. He states that the blood sugar levels are very apt to drop. Sansum, who has been a rather strong advocate of this method of treatment, states in his report of 1933, that he has used this method in one thousand diabetics, and, although he does not believe it has been of any great harm to the patient, he has not seen, except in a very few instances, a case in which the iletin could be decreased. Rabinowitch's original idea was based on the fact that the pancreas could be stimulated to a higher normal secretion of insulin if a high carbohydrate diet is given. This is more or less in direct contrast to other methods used to increase the strength of other organs in the body as, for example, to build the heart to a higher efficiency, rest is used.

My own feeling is that these patients get along just as well with a moderate diet of carbohydrate and fats, usually somewhere between 100-150 grams of each. Under this regime iletin is not used in large amounts. The high carbohydrate school feels that this relatively high fat diet, which is not very high when we consider the low carbohydrate high fat diet of Newburgh and Marsh, is apt to increase the possibility of acidosis. I have not seen this happen among the four hundred diabetics treated in the University diabetic dispensary within the last ten years. In children, who have very little restraint to keep away from high carbohydrate food, this diet may be of some value, but in adult individuals, where we are apt to find definite pathological changes in the islands of Langerhans as found in autopsy, I feel that it is better to decide on a diet half way between the two extremes. It is surprising, the few cases of acute respiratory infections and colds that are found among the University Diabetic Dispensary patients who are allowed to use enough butter and cream to get a satisfactory intake of vitamin D.

Even with the new ideas presented in the first part of this paper in regard to the etiology of diabetes, I still do not see any reason for using the high carbohydrate low fat diet. In my private practice and in the University Diabetic Dispensary I do not use low carbohydrate diabetic food, and money is not spent foolishly upon bulky food without carbohydrate value as was done ten years ago. I feel that the amount of iletin used can be controlled in the same manner on a diet midway between the two extremes. The money thus saved may be used to buy more desirable food such as fresh fruits and vegetables. This is especially true in the case of charity patients. I encourage diabetics to use insulin if they have a tolerance somewhere below 100 grams of carbohydrate, 65 grams of protein, and 150 grams of fat, which gives a glucose value of about 150 grams. It is very important that these patients be kept underweight, that obese people lose weight on a lower caloric intake, and that thin individuals gain some weight in order to hold their strength and to develop resistance against infectious diseases.

The third and last interesting work which has been done within the last year is that of Katz. He has demonstrated that in elderly diabetic individuals, anginal attacks may be brought on by the use of low carbohydrate diets and exercise or a high carbohydrate diet with over-use of iletin. This is thought to be due to the low blood sugar which may develop in either instance and which would thereby possibly remove glyco-

gen from the heart muscle. This is covered more fully in the paper to be presented by Dr. Nathanson, and will not be mentioned any further at this time except to state that elderly diabetics should be controlled in such a manner that a small amount of glycosuria will occur more or less constantly.

Since the Banting period began, deaths from diabetes have been on the increase. The interesting fact remains that death from acidosis has decreased and that mortality from cardio-vascular phenomena has increased. Therefore, if we can possibly do anything in the way of treatment to eliminate this possible hazard it is well to consider it. Katz's work has been of considerable value in maintaining this position. I have seen three very definite cases in private practice in which electrocardiographic tracings and blood sugar determinations have shown definite involvement which have later improved under the proper therapy.

At the present time there is no evidence to show that a high fat diet has any relationship to the development of arteriosclerosis. The theory brought forward by Joslin a few years ago is of interest, but at the present time there has been no scientific data to prove arteriosclerosis has occurred from this source. Arteriosclerosis probably is the result of abnormal metabolism which occurred to these individuals over a period of years which may not be directly related to the type of diet used.

* * *

OCULAR COMPLICATIONS IN DIABETES

ERLING W. HANSEN, M.D.

"Defective vision was first attributed to diabetes by Renauldin in 1814. Diabetic cataract was described by Berndt (1834). Diabetic amblyopia subsequently confirmed, by Liman (1842), Ruete (1843), Bouchardat (1846) and Desmarres (1858) was long considered doubtful, but Jaeger (1856) published the first ophthalmoscopic demonstration of diabetic retinitis and the matter was finally set at rest by Leber (1875). Paralysis of accommodation in diabetes was first described by Von Graefe in 1858, who considered that many cases of amblyopia were due to this cause." (Parson's Pathology of the Eye.)

From the nature of the disease, we have those lesions in the eye which would result from the toxic products circulating in the blood, changes in osmotic pressure, and the vascular changes that take place. Chiefly these affect the retina, the crystalline lens and the nerve supply of the eye and its extrinsic muscles. Permanent reduction of vision and actual blindness may be caused by hemorrhage retinitis, unsuccessful operations for cataract and optic atrophy.

Various observers have reported the incidence of retinitis: Von Noorden, 81 out of 477 cases, 17%; Spalding and Curtis, 16 in 307 cases, 5%; Gray, 66 in 500, 11%; McKee, 127 in 1272 cases, 10%. Roughly about 10% of all diabetics show lesions of the retina.

Diabetic retinitis is difficult to differentiate at times from renal and arteriosclerotic changes. This is especially true, because many diabetics also show albumin in the urine and we are all aware of the arteriosclerotic changes that occur in diabetes. There has been doubt expressed as to whether or not there is a true diabetic retinitis, the argument being that the lesions are seen only in the older patients who have developed arteriosclerosis. We have seen two cases in young persons, who showed no arteriosclerotic changes. The change in one of these cases I will show from a fundus photograph.

Foster Moore gives the following features as forming together a picture which suggests diabetes as a probable cause of a retinitis:

(a) The patches of retinal exudate in diabetes tend to have sharp-cut edges; are often solid and soapy or waxy-looking; are usually distributed in an irregular manner, and sometimes form an irregular ring well wide of the macula. (These have been found by Friedenwald to be masses of colloid in the outer layers of the retina.)

(b) A star figure is uncommon, and if present it does not acquire the degree of symmetry that may be seen in renal cases.

(c) The soft-edged cotton-wool patches, so frequent in severe renal cases, do not appear in diabetes; retinal edema is never so marked, and thus retinal detachment does not result.

(d) Retinal hemorrhages are generally in the deeper retinal layers, and therefore are roughly circular in outline instead of being flame-shaped.

(e) The circular retinal pigment spots which are not rare in later stages of renal retinitis are not seen, I think, in diabetes.

The prognosis is not nearly so grave as in so-called albuminuric retinitis, nor so grave as in arteriosclerotic retinitis. Nettleship followed 48 cases from 41 to 79 years of age. At the time of report, 38 had died, nine within one year, 11 in the second year, 18 between two and eight years, 10 living, two to 10 years after the discovery of the retinitis making 60% who had lived longer than two years. Of renal cases that show retinitis very few live as long as two years.

Lipemia retinalis occurs in rare instances where the blood contains high percentages of fat. The excessive lipoid content in the blood gives a pinkish white tone to the whole eye ground and in the extreme cases all the retinal vessels look as if they contained milk instead of blood. The vessels look flat instead of cylindrical and the veins engorged. There are no other changes in the fundus and the vision remains good. While many patients developing a lipemia die soon after, a goodly number of cases are on record in which recovery took place and the fundus picture again became normal.

Various observers have reported changes in the iris in diabetes. These are extreme edema of the pigment layer with the formation of small cystic spaces so that this whole layer becomes very spongy. There is a reduction in pigment. In operating on a diabetic eye these changes are evidenced by the free pigment which appears in the aqueous.

Iritis occurs infrequently, and there is some question if it is due to the disease itself, or to some other

etiological factor acting in the presence of lowered resistance and the changes described above. When seen, the iritis is usually of the plastic type and responds quite readily to treatment.

True diabetic cataract is characterized chiefly by its rapid development, its homogenous nature and its bilateral occurrence, mainly in young patients. Histologically the changes are those found in other cortical cataracts, though the earliest change is just under the capsule and mostly beginning in the posterior layers. This latter is interesting in light of Duke-Elder's statement that the posterior capsule shows the greater permeability.

In operating for the removal of diabetic cataract or in the removal of senile cataract in diabetic patients, we may expect annoying complications in a fair number of cases. Hemorrhages into the anterior chamber, if iridectomy is done, occur fairly frequently at the time of operation and may recur for some time afterward. Retinal hemorrhage and hemorrhage into the vitreous may nullify the result of operation. Slow healing may take place. Iritis which may be quite obstinate, may complicate the case and cause secondary cataract.

If operation is considered the patient should be free from acetone and diacetic acid and as nearly free of sugar as possible at the time. It is thought by some that the use of insulin increases the tendency to bleeding but there is no real proof of this as far as I know. My own experience with cataract operations on diabetic patients, though not extensive, has not been unhappy.

Harry Gradle summarizes the consensus of opinion regarding cataract in diabetes as follows:

"During the course of diabetes, cataract may appear independently of the sugar content of the blood or urine. Such a catarart may be a senile or a diabetic cataract and the two cannot be differentiated clinically. In younger people (under 40 years of age) a cataract due to diabetes appears as a bilateral, subcapsular rapidly appearing and rapidly maturing opacity of the lens. In older people the same may hold true, but it is impossible to say whether such a cataract is senile or diabetic. After the age of 40, the incidence of cataract among diabetics is certainly no greater than among non-diabetics.

"Diabetic cataract may be operated upon with perfect safety, provided that the patient has no acctone or diacetic acid, and provided that the sugar content of the blood has been reduced to the minimum quantity possible. Unless such is done, there is apt to be a loosening and discharge of pigment cells in the aqueous and a greater susceptibility to pus infection."

(Harry S. Gradle, Lens Opacities in Diabetic Patients, Jackson Birthday Volume, p. 255.)

Gradle's statement that the incidence of cataract in diabetes past 40 years of age is no greater than among non-diabetics is not concurred in by many ophthalmologists.

Changes in refraction may occur very rapidly in diabetics, due to alterations in the crystalline lens composition or contour. An increase in blood sugar may be accompanied by tendency toward myopia, by a change in the refraction index of the lens or by a swelling of the lens, and a sudden decrease in blood sugar by the development of a hypermetropia.

I had the opportunity of seeing one patient, a woman of 63, whose refraction had been constant for 10 years, suddenly develop an increase in hypermetropia. During the 10 years period when her refraction record was in our office she took a +1.00 diopter sphere with a small correction for astigmatism. On November 7, 1932, after a week in the hospital when her blood sugar was reduced, she came in complaining of blurred vision. On that date she took a +1.50 sphere, to bring her vision to its previous acuity. Ten days later her vision was again blurred and she needed +2.25. On January 6, 1933, her vision was blurred with this correction and she then showed a lesser correction. By February 2, she again got her best vision with +1.00 spheres. For the past year this has remained constant.

Ocular palsies have been reported in diabetics by a great number of observers. Mostly there are in structures supplied by the third nerve or by the sixth, so we see ptosis, dilated pupil and internal and external strabismus, chiefly. These may result from central involvement, or from a peripheral neuritis. One occasionally meets with a typical Argyle-Robertson pupil in diabetics: paralysis of accommodation occurs. Retrobulbar neuritis is not uncommon. Most of these nerve lesions respond to treatment with restoration of function.

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THE CARDIAC PATHOLOGY OF DIABETES MELLITUS

M. H. NATHANSON, M.D.
Minneapolis, Minn.

CONCLUSIONS

1. Coronary sclerosis is the predominant cardiac lesion of diabetes mellitus.
2. Coronary disease is relatively infrequent in the earlier decades, but after the age of 50, the incidence is above 50%.
3. Above the age of 50, the incidence of coronary disease is six and one-half times greater in diabetics than in non-diabetics.
4. Hypertension is not a prominent feature in diabetes.
5. Electrocardiography is suggested as a routine diagnostic procedure in elderly diabetics.
6. The recognition of the cardiac pathology is important in prognosis and treatment.

* * *

DIABETIC GANGRENE

A. A. ZIEROLD, M.D.

(ABSTRACT)

Diabetes is complicated by moist and dry gangrene. Moist gangrene is attended by sepsis which requires treatment in the same manner as an infected wound. Only when infection has subsided may treatment of the gangrene itself be considered.

Amputation should not be considered in the presence of sepsis. Dry gangrene will terminate spontaneously at the junction of the middle and upper third of the calf. In either case amputation should be an operation of election and not one of necessity. In a majority of cases the most favorable site for amputation is the junction of middle and upper third of the calf. Amputation above the knee should not be resorted to either as a matter of choice or one of necessity.

* * *

DISCUSSION

Dr. E. S. Platou: The statistics of Priscilla White which Dr. Beard has referred to are extremely interesting. Her comparative measurements of diabetic and non-diabetic children certainly suggest the possibility of a hypophyseal background in the etiology of the disease. The belief that disturbances of other glands of internal secretion may occasionally be secondary to pituitary dysfunction lends support to such a theory. From a clinical standpoint, however, there is difficulty in confirmation of this. For instance, Lawrence reports x-ray of the sella as positive in only 5% of rather typical pituitary types. Specific tests indicative of mild disorders of the "master gland" are so far very inadequate.

Dr. R. C. Webb: The statement that the pancreas was stimulated by the parathyroids interests me at this time. I have recently had an opportunity to observe and operate upon a patient with a parathyroid adenoma the size of a walnut. In a careful study of the history of this patient there was no sign or symptom of hyperinsulinism at any time. On the day of admission, however, the patient had a slight glycosuria which was absent thereafter. There was no doubt about the patient having increased parathyroid activity.

Dr. Archie Beard: The parathyroids and the gonads are said to stimulate the pancreas to greater insulin secretion. The pituitary, thyroid and adrenal glands are said to have a depressing effect. It is fairly common to see patients with hyperthyroidism, hyperpituitism or adenomas of either the pituitary, thyroid or adrenal glands who have high blood sugars and glycosuria, and after treatment, either surgically or under x-ray therapy, the hyperglycemia and glycosuria disappear.

If there is an adenoma present in the anterior lobe of the pituitary gland we might not have acromegaly, but still gigantism might be present.

The parathyroids are atrophied if the pituitary gland is removed in animals. Also, if the pituitary is removed we get atrophy of the adrenal and thyroid glands.

If an adenoma, giving increased secretion of the parathyroid is present, there should be no glycosuria because the parathyroids, according to this theory, are supposed to stimulate pancreatic secretion.

Dr. C. J. Ehrenberg: Is there not some relation between endocrin imbalance and permeability of the kidney to the sugar, for in pregnancy we often observe glycosuria without an increase in blood sugar level.

Dr. Walter H. Fink: I would like to bring out the importance of watching these cases with the ophthalmoscope while under treatment, checking them from time to time, because it has been demonstrated that progressive vascular changes continue in spite of the fact that the case is clinically under control. This is proved by the fact that new hemorrhages and exudate are found, and the contention of many reliable authorities that the use of insulin may be responsible for a progressive vascular change in the eye. It is just a suggestion to those using insulin to watch the effect on the vascular system.

Dr. C. W. Rucker: Dr. Hansen mentioned that there is some doubt about the existence of a real retinitis of diabetes. I think most people agree that merely the increased sugar in the blood does not produce a change in the retina. The fundus picture shown on the screen of the hard waxy exudate and the scattered hemorrhages occurs in arteriosclerosis rather frequently among people who have no diabetes. The same picture occurs in older diabetics who have arteriosclerosis. It is said to occur in people past 40, the average age for most of them being around 55 and it is said to be very rare under 40.

Last Fall at the University Hospital I came across a number of young patients who had retinitis of diabetes. I remember that two were boys in their late teens, one about 17 and the other about 19. Neither one had any demonstrable arteriosclerosis, no change in kidney function and no elevation of blood pressure. I was surprised at this and looked into the matter. There is not much about it in the literature. Dr. Henry Wagener of Rochester, Minn., tells me he has seen half a dozen such cases during the past few years, and had seen none previously.

The answer to the puzzle might be that now that we have insulin the young people are living longer than they used to, long enough to get vascular changes and the consequent changes in the retina. Previously they died before these changes occurred. From this we may expect that in the next few years we will see more and more retinitis of diabetes in the young people.

Dr. Beard: I want to bring out the fact that as diabetic patients are living longer, naturally they will have more arteriosclerosis and their mortality is going to increase on the cardio-vascular side rather than in the old days from acidosis and coma.

There have been no facts brought forward that insulin is the cause of arteriosclerosis. It has been suggested once or twice this evening that it might be. Patients who have not used insulin will show arteriosclerotic vessels of their feet, changes in their electrocardiograms and retinal vessels although they have not had any iletin therapy. We have followed the patients over a period of three years at the University Hospital and find that all three conditions are found together. Many times it is more pronounced in the large vessels of the feet than in the small arterials involving the eye.

I would like to ask Dr. Hansen why it is his department very frequently asks that the patient be sugar free before they are operated for cataracts. Is it because of the hazard of the operation or is it possible that the cataract may improve when the patient becomes sugar free?

I am anxious to have Dr. Zierold bring out two or three points in his discussion. I feel that his remark about low amputations is correct in most instances. Many times we find that in amputations below the knee a slough of the stump or opening of the wound occurs. Is it not possible that there are some instances where high amputations (amputations above the knee) would be more desirable where there is a marked arteriosclerosis of the lower extremity?

Today we appreciate that diabetic gangrene is principally an arteriosclerotic change and that infection is superimposed upon that condition. This makes it a great hazard. For that reason, it seems to me, there should be an election as to the site of amputation, depending upon the infection of the extremity involved.

The dermatologists have given us very good service in the treatment of this condition with hot packs. At times certain numbers of these patients have had open drainage. These two methods of treatment have cleared up the infection. At times we have been able to save most of the extremity with only an amputation of possibly one or two toes.

I feel that amputations below the knee are very definitely indicated in cases of dry gangrene but in moist gangrene, I think it is probable that some cases will do better having an amputation above the knee. I still do not wish to state that I am opposed to Dr. Zierold's feeling in this matter, but just wish to state that there are certain cases in which higher amputations, I think, are indicated.

There is another feature which I think must be considered in deciding the time and site of amputation. This is the organism present, staphylococcus, streptococcus or gas bacillus infection.

Dr. E. T. Evans: In discussing Dr. Zierold's excellent paper, there are several points which I believe are worth emphasizing. Lower leg and mid thigh amputations are never weight-bearing. They are conicle stumps which depend upon the sliding cuff in the lower leg and pressure against the ischial tuberosity in the upper leg amputations. The weight is transmitted to the base of the cone. The Pirigoff and Griti-Stokes amputations are the only weight-bearing amputations.

I bring this out because the experience has been that the lower leg amputation is often a poor amputation and I think we are going to come more to the Griti-Stokes amputation as a procedure of choice unless the indications are that we must go to the mid thigh. I think that probably, as time goes on, and I think that Dr. Zierold feels that way even now when he speaks of the lower leg as a poor amputation, we will appreciate more and more that this is true. We have found this in our experience among the war veterans where reamputations are necessary.

One reason the mid thigh and lower leg amputation has been so popular is because our artificial limb men have required us to give them a cone shaped stump.

As far as the remarks about gas bacillus infection, remember this, I do not think that the mid thigh amputations are compulsory in the gas bacillus cases, and I think the work of Manson and others, recently, on gas bacillus shows that we do not have to fear gas bacillus as much today, except in the fulminating case, as we previously did. If we can improve the local circulation and get rid of our gangrenous area we frequently will get away without doing too high an amputation.

Dr. Beard: In closing, there is one other remark which I wish to make. I sometimes wonder, in the type of patients we see at the University Hospital, if it makes very much difference whether the amputation is below or above the knee as far as artificial limbs are concerned. I doubt if very many of those patients ever have enough money to buy any type of artificial limb. Most of them seem to be in such poverty and want, and many times are senile and so old that I doubt if they could buy an artificial limb or use it properly.

Dr. Douglas P. Head: In regard to insulin having some deleterious side effect when continued over a long period of time, my limited experience agrees with Dr. Beard's that this possibility is extremely remote. However, it was interesting to note that in Continental Europe they were very loathe to give insulin to diabetics with coronary disease, and only did so when necessary to control the higher grades of acidosis. I believe an attempt should now be made (by means of a large and controlled series of cases followed for several years) to determine more accurately the effects, if any, of the long continued use of insulin.

Dr. Norman Johnson: I am intrigued by one point which may deserve emphasis. We are all endeavoring to dig up fundamental principles which regulate human physiology. One such principle is that nature abhors a sudden change. Of this you are well aware by a great many examples. One may not reduce an ascites too rapidly without trouble. One may not inject a hollow viscus even well within the limits of its capacity too suddenly without distress. Tuberculosis may destroy a whole lung by degrees and the patient survive but the sudden shock of pulmonary embolus may cause death.

Most of these diabetics which we see have been diabetics for some time. Nature has, in that time, provided certain compensatory mechanisms which have enabled the individual to remain normal in spite of a very much higher blood sugar or a rather severe degree of acidosis. In the last decade we have received a substance which may very suddenly alter this status in a patient who has already accustomed himself to these chemical changes, namely, insulin.

Dr. Hansen has pointed out that individuals who have high blood sugars suddenly reduced may have, as a result, a temporary loss of vision. All of us who have handled diabetics know the occasional acute edema which follows the rapid reduction of blood sugar or perhaps the rapid alteration in the acid-base mechanism. In cardiac edema we often attempt to relieve the fluid accumulation by the production of an acidosis. In diabetes it seems we often diminish the acidosis rapidly, because it seems the proper procedure, with the result that the sudden change produces a generalized edema of the tissues. Perhaps, in cardiacs who have diabetes, we are not helping many of them by these rapid reduc-

tions. It may, in fact, be much more intelligent to reduce their acidosis and high blood sugar very much more slowly than we are prone to do. We like to get it over with.

I was glad to hear Dr. Beard say that it was a good thing to keep a little sugar in the urine of these elderly diabetic patients. If there has been a great deal there for five or ten years, it is not going to do an irreparable harm to have a small amount remain. I have a patient who, for five years, has somehow made his way with loads of sugar in his urine. Very slowly, I thought, I reduced the sugar from its high blood level and corrected the acidosis. It was not until he had, for the first time in five years, reached what we call a normal level, that he had his first cardiac accident. This may have been produced through a rather sudden change in a man who had already developed compensatory mechanisms to take care of the forces at work. I would hate to think that my enthusiasm for the level of the blood sugar alone might lessen his days and yet this may have been the case.

Dr. Erling Hansen (in closing): This question of insulin effect has been more or less in my mind. I cannot say the changes as far as the eye are concerned, have been greatly influenced since we have used insulin. As I intimated in my paper, some men feel that the use of insulin before operation for cataract, for instance, in a diabetic, increased the tendency toward bleeding. I said in my paper that there was a question in my mind about this.

A similar question might be raised regarding the greater incidence of arteriosclerosis. We saw arteriosclerosis in diabetics before the use of insulin and we do not know that the incidence is greater. I do not know that any real study has been made so far as the eye is concerned since the introduction of insulin as compared with before. We see plenty of bleeding in these cases and that is due to the vascular change rather than the type of treatment, it seems to me. I question in my own mind, without knowing very much about diabetes in general, if these aren't rather loose statements.

In answer to Dr. Beard's question about having the patient free from acetone and diacetic acid, also, I think the thought has been that the bleeding was less which, again, for the above reasons, I question, but it is certainly true, I feel, that with the patient in better condition and with the blood picture more free from these deleterious things, we have less infections. It has been pointed out in surgery, generally, that we have more infections in the presence of these things and eye surgery is no exception. I also feel we have slower healing in these cases.

As to the question of visual changes, most of the changes which took place as far as the refraction was concerned, were toward the myopic side. When a patient had a high percentage of blood sugar the lens took on water. This takes place, probably, first by salt retention and the consequent difference in osmotic tension. Since the use of insulin where sudden changes have been made, many more cases have been reported where refractive index of the eye suddenly rises to the other side by the sudden reduction of the blood sugar, causing a hypermetropia.

In regard to the development of cataract, there are some cases in the early stages of cataract development, for instance, which show the formation of vacuoles between the lens fibers which disappear and what has seemed to be an incipient cataract clears up under treatment of the diabetes. There may be a few cases which have been arrested or cleared up where there has been some lens change, but for the most part the treatment of the case has no influence on the development of the cataract even when the patient is kept quite free from sugar. The same is true in regard to retinal hemorrhages. Patients under treatment by diet and insulin and doing very nicely will still show new spots of hemorrhage even though the general condition seems to be improved.

Dr. A. A. Zierold (in closing): Dr. Maxeiner preceded me at the General. He amputated for diabetic gangrene below the knee successfully. I followed him and established the procedure which has been in force the past three or four years. I do not know how fully Dr. White will bear me out in this but it is my collection that but one case required secondary amputation and that, I feel, was a technical fault.

In the first place, the amputated stump that breaks down was amputated too soon. That is, provided it was amputated at least at the 4″ level.

The treatment of moist gangrene is not the treatment of the gangrene, it is the treatment of the infection. The infection must be controlled before any attempt is made at amputation. The amputation must be an operation of election. It must come at a time when the infection has subsided and when you are not forced to operate in the face of a bacteremia. In amputating, there must be some technique adapted to the peculiar circumstance. No tourniquet may be used and no flaps may be turned back. The circulation which determines viability flows from the outside, inward. The Lexer type of amputation which employs the blunt stump with no stripping back of flaps is an effective measure.

I have had no occasion to re-amputate. I have one patient who suffered from a very severe diabetes and who was treated in a rather haphazard manner and survived his treatment as well as amputation at the junction of the middle and upper third of the calf. He returned with an infection of the opposite foot. That foot was split from the toes up to the ankle and after several weeks the infection had subsided and his leg was amputated at the junction of the middle and upper third. He is walking on two artificial legs. No one who has not observed people with amputations will appreciate the value of the natural knee joint. It cannot be replaced. There is no type of amputation that will substitute for the knee joint. In the individuals who are bedridden and who will not walk again and who are senile, it is quite immaterial.

The one objection to the low amputation is, as Dr. Evans states, that it is not an end bearing stump. It

is a cone which transfers its weight bearing against the knee. It is frequently susceptible to abrasions. I feel myself more readily accepting the Gritti-Stokes amputation which involves the joining together of the patella and femur.

The amputation through the thigh, I think, is inexcusable, under any circumstances. If a patient has gangrene to that point it might just as well not be amputated. The mortality in amputations of necessity above the knee is such as to almost exclude it as a rational surgical procedure. As a practical procedure it is not a weight bearing stump. It is a poor stump and a poor substitute and if the knowledge of the surgeon is directed toward control of the infection and limiting of the gangrene, he will not have the occasion to amputate above the knee. If infection extends to that point, then he had better attack that infection rather than attempt to amputate. He will be better off spending his time treating the infection and ending up with a healed deformed stump and then amputating, than to amputate when the amputation is a matter of necessity.

Jas. K. Anderson, M.D., *Secretary.*

SOCIETIES

THE MINNESOTA RADIOLOGICAL SOCIETY

held its winter meeting at the University Hospital, Minneapolis, on March 10, 1934. The following program was presented:

1. Roentgenologic Studies in Multiple Births
   Leo G. Rigler, M. D.
2. The Incidence of Paraesophageal Hernia in Pregnant Women
   John B. Eneboe, M. D.
   Discussed by Walter H. Ude, M. D.
3. Radiation Effects on Tissue Cultures of Lymph Nodes
   Joseph T. King, M. D. and K. W. Stenstrom, Ph. D.
4. The Ventriculogram in a Case of Tuberosclerosis
   N. J. Berkwitz, M. D. and Leo G. Rigler, M. D.
5. Benign Strictures of the Stomach
   Jacob Sagel, M. D.
6. Observations on the Radiation Therapy of Carcinoma of the Breast
   K. W. Stenstrom, Ph. D.
   Discussed by E. T. Leddy, M. D.
7. Histologic Studies of Human Liver After Injection of Thorium Dioxide Sol
   Leo G. Rigler, M. D. and Rudolph Koucky, M. D.
8. The Epiphysis of the Tuberosity of the Fifth Metatarsal
   John B. Eneboe, M. D.
   Discussed by John D. Camp, M. D.
9. Roentgen Observations on Acute Amebic Colitis
   Kano Ikeda, M. D.
10. Roentgen Observations on Early Tuberculosis in Young Adults
    Leo G. Rigler, M. D.
    Discussed by M. B. Hanson, M. D.
11. Case Reports
    a. Spontaneous Gastro-enterostomy
       C. N. Borman, M. D.
    b. Lympho-epithelioma
       C. O. Hansen, M. D.
    c. Trichobezoar
       Oscar Lipschultz, M. D.
    d. Osteomyelitis of the Patella
       Jacob Sagel, M. D.
    e. Gall Bladder Obstruction of the Small Intestine
       C. N. Borman, M. D.

ADDRESSES

The American Board of Radiology

B. R. Kirklin, M. D.

Observations on the Diagnosis and Treatment of Malignancy

William T. Peyton, M. D.

The Minnesota Radiological Society wishes to announce the establishment of an annual lectureship in Radiology in honor of Dr. Russell D. Carman. This is to be known as the Russell D. Carman Memorial Lecture, and will consist of an address by a prominent radiologist at the annual meeting of the Minnesota State Medical Association before the general assembly of that body.

The first in this series of lectures will be given by Dr. A. B. Moore of Washington, D. C., at the meeting of the Minnesota State Medical Association in Duluth, July 16, 1934. In addition, at this meeting, Dr. Donald C. Balfour of Rochester, will deliver an address on the life of Dr. Russell D. Carman.

Leo G. Rigler, *Secretary*

NEWS ITEMS

Dr. J. E. Shull, Alpena, S. D., has been spending a few months in New Orleans, in special postgraduate work.

Dr. Wm. J. Mayo, Rochester, has been taking a few weeks vacation by visiting some of California leading cities.

Dr. F. H. Moss, a recent graduate of the University of Minesota, has opened offices for general practice at Stanton, N. D.

Dr. Roland Hubner, a recent medical graduate, will become associated with Dr. G. A. Landman, at Scotland, S. D., in general practice.

Dr. Fred A. Erb, Minneapolis, was re-elected president of the Hennepin County Tuberculosis Association, at their recent annual meeting.

The city hospital at Owatonna, Minn., has recently been bequeathed $16,000 by one of her generous citizens whose will was probated last month.

Dr. H. W. Huseby, Floodwood, Minn., died recently at a Duluth hospital, after a few days illness of pneumonia. Dr. Huseby was a graduate in the class of 1926 at the University of Minnesota.

A warning against eating overly hot and highly seasoned foods as a definite means of preventing cancer of the stomach was issued recently by Dr. William J. Mayo, head of the Mayo clinic at Rochester.

Dr. Morris Fishbein, editor of the Journal of the American Medical Association, addressed the members of the Hennepin County Medical Society on April 2. His subject was, "Medical Advertising and Publicity."

At the annual meeting of the Lewis and Clark Medical Society, held at Helena, Mont., last month, Dr. L. H. Fligman, was elected president, Dr. B. V. McCabe, vice president, and Dr. E. H. Lindstrom, secretary.

Dr. E. Rodenhuls, Corsica, S. D., who has been in active practice in that city during the past thirty years, died on March 5th, from hardening of the arteries. The doctor was a graduate of the University of Chicago.

Dr. J. C. Ohlmacher, of the School of Medicine, University of South Dakota, Vermillion, was the guest speaker before the regular meeting of the Des Moines Academy of Medicine and the Polk County Medical Society, held March 27.

The medical society of the sixth district held their March meeting at Bismarck, with the largest attendance of the season, there being about fifty outside visiting physicians present. Dr. Wm. Peyton of the University of Minnesota, Dr. A. W. Larson, Bismarck and Mr. Scott Cameron, Attorney, Bismarck, were guest speakers.

One hundred and twenty-five Minnesota physicians registered for the two-day short course at the University of Minnesota, this being twice the number who ever attended any previous course. Clinics were conducted in neurology, dermatology, orthopedics, obstetrics, gynecology, otolarynology, x-ray diagnosis and preventive medicine.

At the April meeting of the members of the Minnesota Academy of Medicine held at the Country Club, St. Paul, two very interesting papers were presented, one by Dr. S. Marx White, Minneapolis, "Importance of Non-Painful Features of Coronary Occlusion," the other by Dr. H. E. Hullsiek, St. Paul, "The Doctor of Fiction."

The district medical society held their March meeting at Aberdeen, with two guest speakers on their program, Dr. V. S. Counseller, Rochester, speaking on "The Beneficial Effects of Prolonged Heat in Pelvic Infections," and Dr. J. Sagel of the University of Minnesota, a paper on "Benign Lessons of the Stomach and Duodenum and Thorotrast Visualization of the Liver and Spleen."

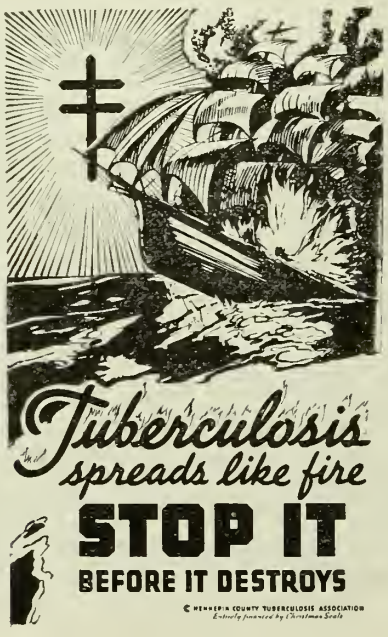
The annual meeting of the Whetstone Valley District Medical Society have elected the following officers for the year: Dr. A. F. Brown, Webster, president; Dr. C. M. Peterson, Sisseton, vice president; Dr. W. H. Karlins, Webster, secretary. Papers were presented by Dr. P. R. Billingsley, Sioux Falls, on "Endometriosis," the other by Dr. W. H. Karlins, Webster on "Functional Treatment of Fractures."

Delegates from eight states attended the annual convention of the Central District Physical Education Association, held in St. Paul, April 4 to 7. The association is comprised of groups connected with the various phases of health and physical education and recreation in schools, colleges, universities and communities. The central district includes Minnesota, North and South Dakota, Iowa, Nebraska, Kansas, Missouri and Colorado. The convention program included general sessions, sectional meetings, round table discussions and demonstrations.

The Minnesota State Board of Medical Examiners has issued a warning to three unlicensed practitioners of healing, so-called "bone-setters," that they are to cease their activities unless they are registered under the Basic Science Law and licensed to practice. These men and the towns where they have been practicing are: P. D. Hepner, Butterfield; Claus Hiebert, Bingham

Lake, and Jacob Goertzen, Mountain Lake. These persons are not licensed to practice under the Basic Science Law nor the Medical Practice Act and they will not be permitted to treat people in the future, in violation of the laws of the state of Minnesota. The Medical Board respectfully requests that any case of treatment subsequent to March 17 by any of these persons be promptly reported to the State Board, St. Paul, and action will be taken to force a compliance with the laws of the state.

Stanley C. Flanning, fifty-seven years of age, entered a plea of guilty to practicing healing without a Basic Science Certificate, at Rochester, and the district court imposed a sentence of five months in the county jail, which sentence was suspended, and the defendant placed on probation conditioned upon his absolutely refraining from practicing healing in any manner in the future. This sentence should be quite effective in preventing the defendant from practicing in the future. Flanning, who came to Rochester from Waterloo, Iowa, formerly was in the real estate business. He has had no medical training whatsoever, and for about three weeks prior to his arrest he had been treating at least two patients for diabetes. His treatment consisted of injections of insulin with a hypodermic needle. He also made examinations of the urine. Following an investigation by the Minnesota State Board of Medical Examiners Flanning was arrested, charged with practicing healing without a Basic Science Certificate. He stated to the court that he had only treated these two patients, and that he had been in the "business" less than three weeks.



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Vol. LIV, No. 9

Tuberculin*

Esmond R. Long, M.D.
Philadelphia, Pa.

History

THE history of tuberculin is a dramatic story, carrying us back to Robert Koch, who discovered the tubercle bacillus. In 1890 Koch found that injection of culture medium on which tubercle bacilli had grown, produced quite different effects in normal and tuberculous animals. The normals were practically unaffected, whereas tuberculous guinea pigs developed severe constitutional symptoms with fever and collapse, and in many cases died a day or two after the injection. In those that died signs of recent acute inflammation were found around the old lesions of the disease.

This specific action of the culture medium from the growth of tubercle bacilli, affecting the tuberculous but not the normal animals, at once seemed to Koch to offer possibilities in the treatment of the disease. In 1890 the principle of immunization of animals with toxic products from bacteria, rendering them resistant to the action of these microbes, appeared one of the most promising doctrines in the history of medicine. Koch's early experiments on animals convinced him that this culture medium, freed from live bacteria by heating and filtration, could indeed cause healing of tuberculous animals, and after a few trial experiments in man, of apparently favorable import, he proceded to launch the substance as a cure for the disease.

The enormous furor in the early eighteen nineties and the profound disappointment that followed the failure of Koch's material to effect the cures prophecied by the discoverer, are well remembered today. That phase of the subject we need not go into, however. Within a few months of its introduction the new material, now known as "tuberculin" was found to have distinct diagnostic possibilities. As early as 1891 veterinarians all over Europe were injecting it into cattle, and in view of its known specific action on tuberculous animals, accepting a resultant fever as evidence of the existence of tuberculosis.

Diagnostic use in man, however, did not come into vogue for a good many years. Its first introduction is due to Clemens von Pirquet, at that time a young and rising pediatrician in Vienna. At a meeting of the Imperial Society of Physicians in Vienna on June 14, 1907, von Pirquet demonstrated the action of tuberculin on the skin of a tuberculous child, prophecying a wide application of the material in the detection of tuberculous infection in children. A few months later he published an article entitled, in translation, "The Diagnostic Value of the Cutaneous Tuberculin Reaction as Determined by One Hundred Necropsies." In this article he reported that out of forty-eight children dying of or with tuberculosis thirty-one had given a positive skin test with tuberculin, while fifty-two children dying of other diseases, and proved by post-mortem examination to be free from tuberculosis, had all failed to react. Hence tuberculin appeared to him to have considerable diagnostic value.

Pirquet's idea was rapidly taken up in other

*Prepared especially for THE JOURNAL-LANCET.

countries and his conclusions confirmed. New methods for use of the substance were at the same time proposed. Pirquet's method was to scratch the surface of the skin, thus removing a little of the protecting cutis, and put a drop of Koch's tuberculin on the abraded surface. As the drop dried, some of the material was absorbed and the result, in the presence of tuberculous infection, was a zone of inflammation around the spot. In non-tuberculous children this inflammation was entirely lacking. Several other investigators in the following year, including Mantoux in Paris, and a little later Escherich and Hamburger in Vienna, proposed replacing the scratch method by the injection of a small measured amount of the substance into the upper layers of the skin, claiming that in this way the test could be better regulated and made more delicate. Still other methods were suggested, only one of which is much used today. This is the inunction method recommended by Moro of Munich. It was introduced to avoid the pain incident to scratching the skin or puncturing it with a hypodermic needle. Moro's method consisted of rubbing into the skin a salve containing tuberculin. The result was approximately the same, although the test soon proved definitely less precise than the other two.

The remarkable fact about all the tests was their specificity. With a few exceptions the patients with present or past evidence of tuberculosis reacted to the tuberculin by zones of inflammation in the skin, where the material was introduced, while the skin of those free from tuberculosis failed to respond. This fact was logically interpreted as evidence that tuberculous infection had conferred new powers on the tissues of the body, enabling them to react speedily and acutely to certain products of tubercle bacillus present in tuberculin, a property not possessed by the tissues of non-tuberculous people. In the term introduced by von Pirquet, the tissues of those who had been infected with tuberculosis had become "Allergic."

Administration and Types of Tuberculin

Thus developed the several methods for the diagnostic use of tuberculin in practice today. Each procedure has its proponents. The scratch method is admittedly less delicate than the injection, but seems to call forth less objection from the children and their parents. The inunction method is still less accurate, but meets no objection at all. A good many physicians have felt that the freedom from opposition to the test in these two methods has compensated for their lack of delicacy. Others, who will be satisfied only with the best, insist on the injection method because of its accuracy.

But just as a variety of methods of administration were available, a variety of materials, all called tuberculin, were at hand. Koch himself, who was interested in treatment rather than diagnosis, had changed his method of preparation several times. And at least fifty other ways of making tuberculin had been described by this time. All of the preparations possessed the virtue of specificity. That is, they caused reactions in tuberculous and not in non-tuberculous animals and men. The preparation that found the most extensive application, and practically the only one that has survived, was the first one introduced by Koch himself, viz., his Old Tuberculin, commonly abbreviated as OT. It is made in a very simple manner by growing tubercle bacilli several weeks in the incubator on a watery broth containing peptone (an artificial digestion product of meat), meat extract, glycerol and salts, boiling the whole growth for an hour, filtering off the bacilli, and concentrating the filtrate to one-tenth of its original volume. The preparation thus made contains the desired specific substances introduced in the liquid by the tubercle bacilli in the course of their growth, but also inevitably contains all the unused residues of the original medium, such as peptone, meat extract, glycerol, salt, etc., which are of no value in the reaction whatsoever.

Yet even in this unrefined form tuberculin has proved of immeasurable value. Over and again the specificity of its action has been demonstrated in experimental animals under controlled conditions where the exact state of the animal as respects tuberculosis was known, and for many years practical use of this specificity has been made in the recognition of tuberculous infection. Before we consider its use as a weapon in the direct attack on human tuberculosis it will be profitable to consider the application of tuberculin in what has proved one of the most successful of all campaigns in the interest of public health, that for the eradication of tuberculosis in cattle and the corresponding extinction of bovine tuberculosis in man.

Eradication of Bovine Tuberculosis

This campaign began years ago in the hands of a group of far-sighted men in the Bureau of Animal Industry in the United States Department of Agriculture. It was an innovation in animal husbandry. A certain amount of tuberculosis was considered inevitable in cattle. Abroad the figures for infection were very high. An incidence of only 15 per cent in a community was considered

unusually favorable. It was not uncommon to find 100 per cent of a herd reacting positively to tuberculin. It was thought that sufficient protection of people drinking milk was secured by boiling or pasteurizing the milk. In America nothing less than the destruction of all tuberculous cattle was proposed.

Naturally the campaign met a great deal of opposition at first. It meant slaughtering many apparently fine cattle. To be sure a certain compensation was granted by the Government for each animal killed, but it seldom approached the value of the live animal. But with increasing understanding by owners of stock, and steady persistence on the part of the leaders of the movement in Washington, as well as their representatives in the various states, the campaign gradually gained sympathy and momentum, and now appears to be in sight of complete success. Since 1918, when the campaign started, more than 115,000,000 cattle have been tested with tuberculin, and 2,693,570 positive reactors found. In the year 1931-32 nearly 13,500,000 cattle were tested, the incidence of positive reactors being 1.9 per cent. In 1918 the incidence was 4.9 per cent. Less than two per cent of the cattle in the United States, are tuberculous today. In many large regions the rate is less than half of one per cent. It is no wonder that in the United States bovine tuberculosis, as an affection of man, has become a rarety.*

Tuberculin in Epidemiology

Obviously the campaign for the eradication of tuberculosis in man cannot be carried on by the same methods as in cattle. Yet there are certain similarities in method, and tuberculin is proving almost as useful in the human as in the bovine campaign. It is employed less as a diagnostic agent in the individual case than as an epidemiological measuring device for estimating the incidence of tuberculous infection in a community. It is, of course, well known that by no means all persons reacting positively to tuberculin have active tuberculosis. In fact only a small portion are so afflicted. Tuberculin is so delicate in its action that it detects all cases that have ever been infected, even if, as is commonly the case in human tuberculosis, these are long since healed. But the important fact is that, with very few exceptions, the list of those reacting positively includes all of the active as well as the inactive cases. Tuberculin enables a separation of the infected from those never infected. Other methods, particularly the X-ray, permit a further separation of the active cases, those requiring special care, from the healed or inactive cases.

The results of tuberculin surveys made in different parts of the United States in recent years have shown a situation of the utmost significance. Just as the mortality from tuberculosis is dropping all over the country, so, too, the incidence of infection, as shown by the tuberculin reaction, is falling. In former years it was considered the rule in urban communities to find eighty or ninety per cent of the children reacting positively to tuberculin by the age of sixteen. This situation still obtains in a few communities, where crowding is severe and there is much opportunity for transmission of infection. In other regions, however, where crowding is not so marked, it is not uncommon today to find the incidence less, often much less, than twenty-five per cent at the same age. There seems to be good evidence that the intense antituberculosis campaign under way in all parts of the country is resulting in the clearing of numerous communities from the disease.

Need of a Standard Tuberculin

It is obvious, however, that we cannot put full faith in the results from various parts of the country until we are sure that the preparations of tuberculin used are comparable. As a matter of fact we already know that the preparations used in different parts of the country in the most widely quoted surveys are not of equal strength. At the Phipps Institute Dr. Aronson has compared tuberculins put out by various manufacturers in this country and abroad, all widely used products, and found a difference in strength of more than 100 per cent between the weakest and the strongest of the best makes, as measured by tests on tuberculous guinea pigs. Among other makes the difference was enormous, some being very strong and others practically inert. In one of the most exhaustive studies ever made of a tuberculosis situation, the Tuberculosis Research Committee operating with the South African Institute for Medical Research, had a similar experience. They wrote "There are various tuberculins on the market and since it was desirable that the same preparation be used throughout, a test was made of the various 'makes' available. . . . Many of the preparations were unsatisfactory, and it was learnt as the result of enquiry overseas that this was a familiar experience."

A standard tuberculin, used by everybody, is highly desirable. Only when the same product is used throughout the country in the same strength and by the same method of administration, will the results from all parts of the country, which now

*From an editorial, Journal of the American Medical Association, 102 (1934), 48.

seem so highly significant, attain full value. If surveys made in Minnesota and Iowa on the one hand and Pennsylvania and New York on the other, yield different results, when the material injected is the same, we shall know that there is a genuine difference in the amount of tuberculous infection in the two regions.

A satisfactory preparation of tuberculin, suitable for a standard, must possess the several virtues of specificity of action, high potency, stability, constancy of strength and freedom from any accompanying materials that might obscure the reaction. The Research Committee of the National Tuberculosis Association has for some time been concerned with the production of such a substance. Several years ago it was discovered that purified proteins from the culture medium in which tubercle bacilli had grown, possessed practically all of these requisite qualities. An extensive trial has been made of two of these, called by their discoverers MA 100 and TPT, the results of which indicate that these substances have all the diagnostic delicacy of Old Tuberculin, and may even elicit reactions in a good many cases of infection that the latter fails to detect.

However, one objection to their use has been discovered, viz., the possibility that uninfected people, repeatedly tested, may, as a result of this continued application, become hypersensitive to the products, without actual infection. That is, injection of these purified proteins several times repeated might ultimately give rise to false positive reactions.

The question has not been entirely settled, but it seems wise to recognize the possibility and meet it by modifying the specific protein product so that it will lose its sensitizing character without giving up any of the qualities desired in a standard. It is well known to chemists and immunologists that the sensitizing property of a protein is to a considerable extent dependent on the molecular weight. It has been found by Dr. Seibert, who has taken the most active part for years in the investigation of tuberculin proteins, that a number of simple methods will accomplish the purpose. As she reported at the Toronto meeting of the National Tuberculosis Association in 1933, the heating that is a feature of the ordinary preparation of Koch's Old Tuberculin has exactly this affect. Specifically it reduces the molecular weight of the protein that accumulates in the culture medium to about one-tenth of its original value, and, what is particularly to the point, destroys its sensitizing properties, as proved by animal test.

A Standard Proposed

To make a long story short, there are many good reasons for using the specific active principle of tuberculin exactly as it occurs in the best preparations of Old Tuberculin, but freed from the extraneous substances that are present in the latter. It is now known that Koch's Old Tuberculin can be improved if made by Koch's original method, but from a medium of pure chemicals instead of the original medium of peptone, meat-extract and glycerol. The Bureau of Animal Industry of the United States Department of Agriculture, which has had such signal success in its whole tuberculin campaign, has found such a tuberculin superior to the former OT and now employs it in its work.

It is easily possible by Dr. Seibert's methods to extract from this tuberculin a highly potent, specific protein derivative of relatively low molecular weight and non-sensitizing character, which has the stability, purity and other requisites of a standard, and this has been done. The method of preparation and the results of the trial tests with the material will be presented at the Cincinnati meeting of the National Tuberculosis Association in May 1934, and shortly afterwards published in full in the American Review of Tuberculosis.

The product represents the culmination of many years of investigation on the active principle of tuberculin. It will be put out in a convenient form eliminating the tedious and at times difficult task of dilution, formerly necessary with preparations of Old Tuberculin. Those in charge of the investigation have every hope that extended trial by the medical profession in this country will demonstrate the effectiveness of the new material, and thereby enable its acceptance as our much needed and desired standard.

THE SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS*

RALPH C. MATSON, M.D., F.A.C.P., F.A.C.S.
MARR BISAILLON, M.D., F.A.C.P.

PORTLAND, ORE.

ALTHOUGH many cures for pulmonary tuberculosis have been proclaimed and flaunted in recent years, none of them have supplanted the most important therapeutic measure of the modern sanatorium regimen, namely, functional rest of the lung. It is well known that

*Prepared especially for THE JOURNAL-LANCET.

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functional lung rest, as a result of bed rest alone, is often sufficient to transform many progressive, febrile forms of tuberculosis in the early and moderately advanced stages into retrogressive, affebrile ones terminating in recovery. However, when the disease has advanced to destructive lesions with cavity formation, bed rest alone is more often insufficient to bring about recovery. Nevertheless, the beneficial results obtained by that agency have led to the development of other methods for providing more functional relaxation of the lung by operative procedures. The operative procedures which have proved most valuable are those providing rest for the lung in a mechanical way through its collapse or compression by methods directed to the lung itself, as by artificial pneumothorax and its adjunct intrapleural pneumolysis, or by methods used indirectly upon the lung by relaxation of the diaphragm or collapse of the chest wall, as in phrenic neurectomy and thoracoplasty. Other surgical methods such as extrapleural pneumolysis, intercostal neurectomy and direct cavity drainage, are of value in certain selected cases. However, because of their general acceptance our remarks will be confined to the first four methods of obtaining functional lung rest.

Artificial pneumothorax: While not a surgical procedure, artificial pneumothorax at least is the first step in any program of collapse therapy. It has been discussed fully for many years and its value well known. Unfortunately, it is often employed too late and too much reliance placed upon it alone; too frequently it is continued for months and even years when a careful survey of the clinical evidence would indicate its failure.

Indications and contraindications: Phthisiotherapeutists should avail themselves of artificial pneumothorax much earlier than is too often the case. It should be utilized in cases of pulmonary tuberculosis with beginning infiltration and positive sputum as well as moderately advanced cases, if, after reasonable trial of strict sanatorium treatment (three to five months at the most) the disease is progressive or not making satisfactory response to treatment. It is often indicated without any prolonged observation. The treatment should be used before destructive lesions are established and satisfactory collapse of the lung is prevented by adhesions.

Hemoptysis, whether slight or severe, is an obligatory indication to establish an artificial pneumothorax at once, provided it is possible to determine from which lung the blood comes.

Tuberculous spontaneous pneumothorax should be converted into a controlled artificial pneumothorax.

Tuberculous pleurisy with effusion should be treated by replacing the fluid with air and an artificial pneumothorax maintained according to the indications of the underlying disease.

The most favorable results will be achieved in chronic fibrocaseous types of tuberculosis without demonstrable excavation and with essential freedom from disease in the contralateral lung. In progressive fibrocaseous cavernous types with lesions more destructive in character, the end results are correspondingly less satisfactory. In active advancing caseous pneumonic and caseous bronchopneumonic types of tuberculosis, regardless of incompatible opinions, splendid results are seen—if a satisfactory collapse of the lung can be established. In unilateral cavity cases, a pneumothorax should be established immediately; in this way there is less danger of intestinal infection, and the possibility of bronchogenic extension in the same lung and to the contralateral lung is diminished.

Renal or cardiac failure or extensive emphysema are absolute contraindications. Tuberculosis of the larynx and intestines is a contraindication if interfering with the patient's nutrition. Controlled diabetes is no contraindication.

The outcome of treatment in artificial pneumothorax depends upon a number of influences: first, the type of disease, its character, degree of activity, complications and the condition of the opposite lung; second, the character of the pneumothorax; third, complications arising during treatment; fourth, social and environmental conditions affecting the length of treatment. If social and environmental conditions are good and the patient is willing to co-operate, the results depend upon, first of all and most important, the type of disease; second, the character of the pneumothorax, and third, the condition of the opposite lung.

Influence on Opposite Lung—While it is unquestionably of greater advantage to have the disease confined to one side, this is not the usual type of case coming for pneumothorax treatment. The presence of even active disease in the contralateral lung does not necessarily contraindicate pneumothorax treatment, unless it is extensive or of a rapidly advancing character. The danger of activation of disease in the other lung by a pneumothorax on the opposite side has been overrated.

In estimating the prognosis of a pneumothorax case, disease in the contralateral lung is of much less importance than the type of disease and char-

acter of the pneumothorax. If the patient recovers, he does so usually regardless of a lesion in the contralateral lung, and death is much more often due to other causes than to progression of disease in the contralateral lung.

In cases with a more or less stationary cavity on one side, with a fresh bronchogenic extension to the opposite lung, we have for several years been accustomed to establishing the pneumothorax on the side of the new invasion and have repeatedly observed (if the mediastinum is labile) a gradual closure of the cavity upon the opposite side as compression on the pneumothorax side forced the mediastinum to the contralateral one.

Importance of Satisfactory Collapse—The value of a satisfactory collapse as compared with only a partial one, is clearly shown by our end results in cases where a satisfactory collapse was established; of these 48 per cent are clinically well; 20 per cent are arrested; 11 per cent are slightly improved or unimproved, and 21 per cent are dead. Whereas, in those cases where only a partial collapse was obtained, 13 per cent are clinically well; 13 per cent are arrested; 15 per cent are slightly improved or unimproved, and 50 per cent are dead.

One is decidedly impressed with the value of a satisfactory collapse by the fact that of the clinically well cases in our pneumothorax group (which includes all cases wherein either a partial or satisfactory pneumothorax was established, as well as those where no gas could be introduced), 76 per cent had a satisfactory collapse: 18 per cent had a partial pneumothorax, and only five per cent were cases where recovery was the result of sanatorium care alone, after attempts to introduce gas were unsuccessful. The benefits derived from a partial collapse are not magnanimous, but it is certainly deserving of attention, and better than no collapse at all. In most cases a partial pneumothorax should be combined with other operative collapse procedures, or totally abandoned and other procedures substituted; a 40 or 50 per cent chance of recovery would be possible in this way instead of less than a 15 per cent one, which is the best result to be expected from a partial pneumothorax.

We discredit the presumption that pneumothorax treatment should be withheld until after a thorough trial of sanatorium methods, and that it should be undertaken with much deliberation because of the danger of complications. Less than two per cent of our pneumothorax cases died as a result of complications (directly or indirectly related to the pneumothorax treatment) such as gas embolism (two cases), empyema, spontaneous pneumothorax, etc.

Intrapleural Pneumolysis

Since artificial pneumothorax will rehabilitate only from 40 to 50 per cent of the cases having chronic and acute forms of tuberculosis, approximately 60 per cent demand other methods of treatment owing to pleuritic adhesions preventing any gas introduction or retarding a satisfactory collapse. It was formerly our custom to stretch offending adhesions by gradually increasing the intrapleural pressure—however, the results were disappointing and much valuable time lost. In 1913, Jacobaeus proposed a method of severing adhesions with the galvanocautery under thoracoscopic guidance. In 1925 we adopted this method and later modified it. We have been successful in affecting closure of cavities in approximately 70 per cent of the cases operated upon—thus strikingly reducing the large residue of pneumothorax failures because of adhesions.

Our experience embodies the use of both the thoracoscopes of Unverricht and Jacobaeus; the former surpasses the latter only by affording a larger field of vision. After utilizing the galvanocautery for several years, according to the Jacobaeus technic of severing adhesions, we found the smoke as a result of burning was most offensive and the concurrent pain and inability to control hemorrhage and reaction to operation led one of us (R. C. M.) to devise special electrodes* for employing the high-frequency current intrathoracically for cutting adhesions, thus simplifying the operation and minimizing the heretofore detrimental characteristics associated with galvanocauterization. Upon the development of these instruments, we discarded the galvanocautery in preference to the high-frequency current (Bovie Unit**.) Many thoracic surgeons still believe that the open operation has a great advantage over the closed one, claiming that large adhesions may be approached with safety only by the open method. This is contrary to our experience. We are convinced that adhesions which cannot be successfully or safely operated upon by the open method may be easily severed without danger by the closed one.

We have cut not only extensive adhesions extending to the lateral aspects of the chest wall, but also apical adhesions and those extending to the diaphragm. There is no difficulty in cutting through extensive band adhesions, irrespective of location, unless very short and located in the dome

*Manufactured by Mr. Carl McKissick, 425 S. E. Sixth Ave., Portland, Ore.

**Manufactured by The Liebel-Flarsheim Co., 303 W. Third St., Cincinnati, Ohio.

of the pneumothorax cavity. Apical adhesions, with attachments near or over the subclavian vessels, must be approached cautiously, as cutting them is not so simple. It is generally assumed that only adhesions the size of a finger can be severed, but we have repeatedly cut adhesions the breadth of an average hand—this without bleeding or adverse effects.

In the band, cord and string types of adhesions our successes have been technically one hundred per cent—that is, complete closure of cavities has been effected, with disappearance of sputum in cases where such closure was impossible in spite of high pressures formerly employed over lengthy periods.

Our successes, technically and clinically, have been much less (perhaps 50 per cent) with fold and spindle adhesions having a broad chest wall base and thinning out into what appeared a spindle on the roentgen film. These cases are very enigmatic, as the X-ray seldom reveals the actual number of adhesions that are found upon thoracoscopic examination. We have previously emphasized the inherent danger of cutting through diffuse, cone-shaped and some fold adhesions because they usually contain lung tissue, prolongations of a cavity or large blood vessels.

The technic of cutting adhesions is simple, painless (except when cutting takes place near the intercostal nerves or brachial plexus), and there is no shock; but it requires a different background of training than that for pneumothorax treatment. In the first place, the operator must have surgical training and must be indubitably familiar with the anatomy of the pleural cavity and the structure of adhesions. (One of us [R. C. M.] has published a classification of adhesions adequately illustrated in Surgery, Gynecology and Obstetrics, March, 1934.) To recognize these structural intricacies, persistent study of a pneumothorax induced in tuberculous cadavers will be found of much value. However, this fact must not be overlooked: That an old pneumothorax in a living person varies notably from a fresh one in a cadaver. Therefore, beginners should allow themselves considerable practice before attempting the procedure.

Our work at the Portland Open Air Sanatorium has been much facilitated by the construction of a surgical unit in which an inside surgery can be darkened, and at the same time thoroughly ventilated and provided with the necessary electrical connections.

The technic, indications for operation and selection of cases have been fully covered by one of us (R. C. M.) in previous communications.[1 2 3 4]

Complications—We have never experienced a death directly due to the operation in 311 operations on 249 cases here reported . Profuse hemorrhage occurred three times early in our work. Exudate formation of the serous and purulent, as well as hemorrhagic type, was frequently encountered until our technic became perfected. In our last 78 cases, the incidence of serous exudate was 3.8 per cent; purulent exudate 2.5 per cent; hemorrhagic exudate 1.2 per cent. In our entire series there have been no instances of gas embolism, shock or severe surgical mphysema. Severe febrile reactions occurred seven times—2.4 per cent; bronchopleural fistula occurred four times—1.6 per cent, and spontaneous pneumothorax occurred once—.4 per cent.

Results of Treatment—Of the 249 cases referred to, 70 per cent were clinically successful—that is, the unsatisfactory pneumothorax was converted into a satisfactory one and the patient restored to a working capacity with a negative sputum for the last two years.

After an experience of nearly twenty-five years with artificial pneumothorax, during which time approximately 1700 patients have been subjected to that form of therapy, we are convinced it is a mistake to maintain an ineffectual pneumothorax.

As a closing comment upon intrapleural pneumolysis we wish to affirm that we do not advocate cutting all adhesions which may be found upon X-ray examination. In many cases a satisfactory lung collapse follows in spite of them, but when it can be shown that a satisfactory collapse of the lung cannot be obtained after three to five months' trial, because of adhesions of an operable type, then a consideration of intrapleural pneumolysis is obligatory.

Phrenic Neurectomy

After intrapleural pneumolysis has been utilized to the maximum of its advantage, there will still remain a surplus of about 35 per cent of the cases selected for pneumothorax where pleuritic adhesions exclude the possibility of introducing any gas at all or permit only a small pneumothorax to be established. There will be another group in which the pneumothorax is a substantial one but the adhesions will be found, upon thoracoscopic examination, to be inoperable. Adhesions of the latter type more frequently are found over superficial cavities with firm adherence between the parietal and visceral pleurae. Other adhesions, located in the region of the diaphragm, may be found inoperable but have little or no mechanical influence on the status of the disease existing in the upper portions of the lung. For these groups

additional operative collapse procedures to be regarded are phrenic neurectomy and thoracoplasty. And in certain selected cases where adhesions are inappropriate for operation, with cavities in the upper lobe of the lung, one may consider, in addition to the two previously mentioned operations, other methods referred to in the beginning of this contribution.

On cutting the phrenic nerve through an approach in the subclavian triangle at a point where it passes over the anterior surface of the scalenus anticus muscle, an exairesis is performed (Felix) by winding the nerve around a hemostatic forceps and gently evulsing as much of it as is desired—8 to 10 or 12 cm. has produced a satisfactory result in our cases. This operation, nevertheless, simple as it sounds, is not detached from impending serious danger; a fact well known to those experienced in this particular type of surgery. The imminent proximity of large vessels alone makes the procedure one demanding extreme caution in approaching this crypt of vital structures. While the operation is usually quite simple, qualified assistants should be available, also preparation to meet any emergency which might arise. In an exairesis of the phrenic nerve on a cadaver, the pericardium was torn in one instance, demonstrating the vulnerability of that delicate structure. We will not exemplify here the numerous anamolies of the phrenic, as they have been illustrated and defined at length in previous papers. But we will repeat that in the complex types of phrenics, the radical phrenicotomy of Goetze is the most feasible.

Despite the fact that phrenic neurectomy is a minor operation, anyone who attempts it should have thorough knowledge of the topographical anatomy of the neck; even in hands of competent surgeons, fatal accidents have occurred—such as damage to subclavian vessels, the sympathetic trunk, vagus nerve and, of less importance, the thoracic duct. Recently there came under our observation a case where a surgeon supposedly removed a section of the phrenic nerve; however, after the operation, the patient developed a Horner syndrome and no diaghragm paralysis was demonstrable. Following this, a second surgeon reoperated upon the patient and likewise removed a section of what was thought to be the phrenic nerve; this was followed by a unilateral paralysis of the vocal cords and no diaghragm paralysis was demonstrable.

Our experience, particularly in the fibrocaseous cavernous group of cases, substantiates our belief that a phrenic neurectomy should precede every thoracoplasty. A phrenic neurectomy with a partial pneumothorax is also of value in selected cases.

In exudative types of tuberculosis, our results have not been so gratifying; we could not see that it altered the progress of the disease or influenced it in a favorable manner.

In cases where the diaghragm pursues a horizontal course and is fixed by dense pleurodiaphragmatic adhesions, a phrenic neurectomy is of no value. But, contrary to the opinion of some that a phrenic neurectomy is worthless in apical lesions, we have convincing evidence of its favorable influence upon cavities situated in the apex, and we believe the benefits of a phrenic neurectomy are due not only to the rest given the lower lobe but also largely to the reduction in lung volume. The results are particularly distinctive in cases where dense parietal adhesions prevent intercostal separation during inspiration and only abdominal breathing exists.

A phrenic neurectomy must be considered next after a pneumothorax and an intrapleural pneumolysis and before other more radical procedures. But this does not mean that it is necessary in combination with every pneumothorax, irrespective of whether the collapse is satisfactory or not. In cases selected for thoracoplasty, one often sees such a salutary issue from a phrenic neurectomy that the more extreme procedures are unnecessary; it also serves as a test of the integrity of the contralateral lung in the event that evidences of disease are shown there.

A phrenic neurectomy may be done in bilateral cases on the worse side, if one is assured that the worse side is mostly the source of constitutional disturbance. When the cases have been selected with discrimination, diminution of cough and expectoration should take place immediately following phrenic neurectomy. Hemidiaphragm paralysis facilitates expectoration rather than restrains it. A perfect paralysis of the diaghragm must be accompanied by a high position and no movement, or, at least, only a paradox one. There should also be a positive Bittdorf and Hitzenberger phenomenon.

Results—In our series of approximately 500 cases of phrenic neurectomy 15 per cent, including those with cavernous tuberculosis who were candidates for a thoracoplasty, recovered as a result of the phrenic neurectomy alone.

Extrapleural Thoracoplasty

When attempts to establish a pneumothorax have been frustrated by pleuritic adhesions, or when a pneumothorax has been established and adhesions of an inoperable type prevent a satis-

factory collapse, and a phrenic neurectomy has not obtained the desired results, extrapleural thoracoplasty should be decided upon to provide the needed collapse to the lung. A paravertebral extrapleural thoracoplasty should be done in two or more stages, depending on the patient's general physical condition. That one may be confident of a good chest wall collapse, the posterior ends of the ribs must be removed close to the transverse process of the vertebra.

The number of ribs and the lengths to be resected is entirely contingent on the patient's condition; we remove portions of the upper five ribs first, then the lower five or six. In cases of large upper lobe cavities, we follow the upper phase operation with a resection of the upper four or five ribs close to the sternum (mid-axillary line incision), then proceed with a lower phase. In cases where the disease is confined to the lower lobe, we perform the lower phase operation first. In multiple phase operations, the stages should follow one another promptly within the course of one or two weeks. A partial thoracoplasty, whether unilateral or bilateral, may be considered in certain carefully selected cases where the lesions are apical or subapical, with essential freedom of disease below the fourth or fifth rib posteriorly.

The selection of cases for thoracoplasty demands a more exacting study than for pneumothorax. The operation is not advisable in rapidly advancing exudative forms of pulmonary tuberculosis; also, a contralateral lung lesion must be arrested and not too extensive. Thoracoplasty is indicated when the disease is unilateral and of a productive or fibroid type (with or without cavity formation), the patient not too old and in fairly good general condition. If there are large cavities (with a pneumothorax of long standing), the prospect, of course, is not so auspicious. If a pneumothorax exists and the mediastinum is not fixed, the patient may be made a much better surgical risk by fixation of the mediastinum. This may be accomplished by setting up a circumscribed pleuritis by a method used by us for several years and described by our associate, Dr. Ray W. Matson.[5]

The contraindications for thorasoplasty, in addition to those which obtain for pneumothorax, should include poor surgical risks and those with coexistent incurable organic disease.

Our preoperative preparation consists in complete laboratory studies—blood transfusions are given, if indicated. During the week prior to operation the patient is placed on a proteid-free, carbohydrate-rich diet with abundant water and (sometimes) hard sugar candy after meals—also, the patient is trained in early morning cavity drainage, and prepared psychically for operation. The day before operation (and after) he is placed in an oxygen tent one-half hour out of every three hours. We never deviate from this practice, as it has been most conducive to our low postoperative mortality.

We prefer to do the operation under local anesthesia combined with light ethylene. In good risk cases, with normal blood pressure, we often use sodium amytal in hypnotic doses, followed by ethylene gas, and nembutal, ortal sodium or pantapon for preoperative medication. The blood pressure is checked continuously during the procedure; should any manifestations of shock be evident, the operation must be concluded at once. We feel intensely gratified that we have never had a postoperative death from shock.

Too much importance cannot be attached to the postoperative care, and only nurses who have had special training in this type of surgery should attend these cases. As soon as possible after the paravertebral operation has been completed, the patient is placed in a thoracic hammock, which was designed by one of us (R. C. M.), several hours daily. The latent dread of deformity is almost entirely precluded by this contrivance. Tight strapping of the chest with adhesive plaster is necessary throughout the period of osteogenesis.

Complications—We have experienced no deaths from postoperative shock, hemorrhage or wound infection in our entire series of 310 operations on 130 cases. Two postoperative deaths within one week after operation were caused by cardiac failure; the remaining fatalities were due to the development of disease in the contralateral lung

TABLE 1
END RESULTS OF EXTRAPLEURAL THORACOPLASTY

		Per Cent	
Number of cases	130	.....	
Number of operations	310	.....	
Dead—Directly due to operation	2	1.53	—Direct operative mortality.
Dead—Indirectly due to operation (none from wound sepsis)	12	9.23	—Indirect operative mortality.
Dead—From causes not due to operation	14	10.78	—Total dead—21%.
Worse—(Aspiration pneumonia) recent cases	2	1.53	
Unchanged—(Recent cases, more collapse necessary)	8	6.15	
Somewhat Improved—(Recent cases)	6	4.61	
Greatly Improved—Ambulant, recovery probable	26	20.	—Greatly improved and well group—66.1%.
Clinically Well—(All symptoms and positive sputum absent for two years under ordinary conditions of life)	60	46.15	

The material referred to in this contribution is from the combined service of ourselves and associate, Dr. Ray W. Matson.

or its activation, or to progressive disease in the intestines.

Results—The results of a well-executed thoracoplasty are extremely satisfying: Shortly after the postoperative effects have passed, extensive clinical improvement is discernible. The results show about the same percentage of recovery as noted with a satisfactory pneumothorax.

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BILATERAL SIMULTANEOUS ARTIFICIAL PNEUMOTHORAX SOME GENERAL CONSIDERATIONS*

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BILATERAL simultaneous artificial pneumothorax was first advocated by Ascoli in 1912 for the treatment of certain cases of bilateral pulmonary tuberculosis. European circles were first to recognize the possibilities of the measure and today it is employed there rather widely. General appreciation of the treatment's value has been slower to appear in this country, but a review of the recent domestic literature shows that it is now gaining in favor. In some quarters, however, much hesitancy is still being shown towards use of the treatment and it is probable that many patients are being denied the opportunity to benefit from its use. Among those who have published reports of their experiences with the measure, there is more or less unanimity of opinion that it is a rational and valuable treatment when used in suitable cases.

The basis for this form of collapse lies in the fact that a partial or hypotensive pneumothorax influences a tuberculous pulmonary lesion favorably in most instances. The correctness of the latter statement is now generally conceded and so warrants no further emphasis here. In its application to bilateral pneumothorax, sufficient evidence has been collected to prove that partial collapse used bilaterally and simultaneously may and does in a certain percentage of cases lead to arrest and healing of disease in both lungs.

In general, the indications for the treatment are those which ordinarily govern the use of collapse therapy. It is employed in cases of extensive bilateral pulmonary tuberculosis that do not, as a rule, respond to the ordinary regimen of bed rest. Its greatest field of usefulness lies in the treatment of those cases of bilateral disease with unequal pulmonary distribution where, after a short period of treatment of the more involved side with artificial pneumothorax, the contralateral lung shows signs of increased involvement. In these cases, bilateral collapse must of necessity be resorted to because the original unilateral pneumothorax, having been in effect for only a brief period, may not be discontinued with safety to the patient. Less frequently, in similar cases, the contralateral lung has been subjected to pneumothorax, although no definite signs have been noted of its disease extending. In these cases, after a period of treatment with unilateral pneumothorax, further improvement ceases because of continued low-grade activity in the uncollapsed lung and unless the pneumothorax is made bilateral, recovery may be delayed indefinitely. The measure has also been found useful in instances where the disease was originally unilateral but a spread to the other lung occurred shortly after collapse of the initially involved lung had been started. In a fourth group of cases, bilateral simultaneous artificial pneumothorax has been employed as the primary plan of treatment because extensive, more or less equally distributed disease was already present when the patients were first seen. Collapse of a contralateral lung in the presence of an existing unilateral pneumothorax has also been done primarily to control bleeding arising in the uncollapsed lung.

The technic used in producing artificial pneumothorax is the same as that for ordinary unilateral collapse. The successful management of these patients, however, requires closer and more frequent observation. Refills are, as a rule, smaller and are given more frequently. Hence the demands upon the physician's time are relatively greater.

When properly carried out, the measure is comparatively safe. Most patients are not discomforted excepting for the inconveniences of more frequent refills and a greater period of bed rest than is ordinarily required in cases of

*Prepared especially for THE JOURNAL-LANCET.
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single pneumothorax. The dangers and complications are the same as those usually met with in the course of pneumothorax work. Pleural effusion is by far the most frequent complication, having an incidence of about 60% in our cases. Spontaneous collapse is the next in degree of frequency, having a somewhat higher incidence rate than that for simple unilateral pneumothorax. This accident occurred in about 8% of our patients. Pleural shock and air embolism may also be encountered but, insofar as frequency is concerned, are relatively unimportant.

In most cases, pleural effusions produce little or no ill-effects. Occasionally respiratory difficulties may arise from a massive, rapidly forming exudate which will necessitate prompt and perhaps repeated aspiration. It may be said that as a group, these patients tolerate pleural effusions less well than those having only a single pneumothorax. A rather annoying aftermath of this complication at times is the premature loss of the pneumothorax space because of obliterative pleuritis. Lately we have been successful in maintaining the pulmonary collapse by converting the diminishing pneumothorax into an oleothorax, having in effect, oleothorax on one side and pneumothorax on the other. The patients in whom this has been done have tolerated this variation well. In instances where the pleural effusion becomes purulent the affected pneumothorax cavity may be treated successfully with gomenol in oil.

In the absence of complications such as large effusions and spontaneous collapse, respiratory or circulatory disturbances are not produced when the treatment is properly carried out. These difficulties result, as a rule, only when too great a degree of pulmonary collapse is employed. In each patient there exists a limit up to which point the lungs may be compressed without producing discomfort, but when this threshold is exceeded, marked dyspnoea and alarming signs of circulatory failure may result. It is surprising at times how great a degree of collapse some patients can tolerate. We have seen estimated compression of as much as 65% of the total lung volume very well borne by one patient who at the same time was able to be ambulatory. This, of course, is exceptional and should not be considered as a standard. In most instances it is unnecessary to produce collapse greater than 35 to 45% of the total lung volume. The idea in general should be to produce the minimal degree of collapse that will give the desired therapeutic effect and not the maximum degree that can be endured. The treatment is not recommended for those patients who have so much disease that they are already noticeably dyspnoeic while at rest. In these cases, bilateral pneumothorax, even in the slightest degree, will serve only to intensify the respiratory difficulty and it is doubtful if enough collapse could be produced to be of practical value.

Occasions are met with when it is desirable and necessary to use other procedures in conjunction with or supplementary to bilateral pneumothorax. The use of oleothorax both as a disinfecting and compressing medium in conjunction with the treatment has already been referred to. Pleural adhesions occur frequently and at times these interfere with the effectiveness of the collapse. In suitable cases, these adhesions may be severed by means of the closed methods currently being used for this purpose. In other words, bilateral pneumothorax in itself does not contra-indicate the use of closed pneumolysis. Successful division of restraining adhesions often changes a case with a doubtful prognosis to one with a favorable outlook. Where pleural adhesions are of such a nature as to make pneumolysis impractical, phrenicectomy as an adjunct to the treatment may occasionally be used with benefit.

At times, collapse will remain unsatisfactory despite the use of the above mentioned aids. In these instances where the pneumothorax on one side is unsatisfactory, it has been stated that bilateral collapse should not be pursued. However, this should not be applied to all cases. Despite an unsatisfactory collapse on one side, some patients can be successfully prepared for thoracoplasty by continuing with the treatment. In this manner, the lesion in the effectively collapsed side is given the opportunity to become arrested, while the unsatisfactory pneumothorax will to a certain degree check the progress of the disease in the other lung.

End results of the treatment depend upon several factors, chief of which are: (1) Proper selection of suitable bases, (2) the effectiveness of the collapse obtained, (3) the frequency of serious complications, (4) proper co-operation on the part of the patient, and (5) the skill and diligence exercised by the physician in carrying out the treatment. Ineffectual collapse due to extensive pleural adhesions is

unquestionably the most frequent cause of poor results. Improper selection of cases will, of course, be productive of a larger number of failures. Patients who are obviously in terminal straits should not be subjected to the treatment. Very infrequently, however, surprisingly good results are obtained with cases that on the surface appear to be poor risks. A few pleasant experiences such as these have convinced us that in border-line cases the treatment should at least be tried. As was previously mentioned, poor results are apt to be obtained when the measure is used in those cases that are noticeably dyspnoeic because of excessive disease.

The proportion of failures has been high in patients with acute progressive lesions. The disease in these cases will usually continue to spread even where a good collapse is produced. Satisfactory responses are obtained only very occasionally with this type of patient. Cases where the pulmonary lesion has a miliary distribution are also unfavorable subjects.

Satisfactory results, that is, arrest of the disease, may be expected to occur in from 50 to 60% of the cases where the treatment is properly carried out. While this proportion of recoveries may not seem imposing to some, when we consider that a large percentage of those who recover with the treatment would otherwise die in a more or less brief period, it represents an achievement that cannot be denied. Even in those in whom recovery might conceivably occur without the treatment, use of the measure hastens considerably the healing processes and produces an earlier negative sputum. Those economic and hygienic considerations should not be ignored.

Of the patients that recover, some, because of permanent extensive pulmonary changes, remain more or less incapacitated, but others are enabled to return to their usual place in the social and economic scheme. In the cases that terminate fatally, temporary benefit is manifested by the majority. Life is prolonged, symptoms are lessened and generally their remaining days are made more comfortable.

OLEOTHORAX*

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OLEOTHORAX, or the introduction of oil into the thorax usually to replace an existing pneumothorax, has become definitely established as one of the standard methods of collapse-treatment of pulmonary and pleural tuberculosis. Credit belongs to the Frenchman, Bernou, for its adoption in practical use. He first applied it to close bronchial fistula, and the indications and the technique of its employment have developed steadily since he first used oleothorax in 1921.

*Prepared especially for The Journal-Lancet.

Various oils are preferred by different workers. Paraffin, olive and other vegetable oils (e. g., Wesson's) are in common use. All of them act as irritants to the pleura and perhaps, in common with other modifying and antiseptic agents when used to counteract the action of the tubercle bacillus on the pleura, this irritation response may be the way in which they exercise their beneficial effect on the inflamed pleura. Gomenol, a non-toxic aromatic oil, was originally mixed with the oil, and it is still employed by many because of its slight antiseptic action.

Mineral oil is preferable when it is necessary to maintain for some time the collapse of the lung. When the principal attack is against an infected pleura some prefer a vegetable oil. So far I have had such good results with paraffin oil that I have not been influenced by the argument of the greater absorbability of vegetable oils. There is greater chance of contamination and of change of acidity in the latter.

Oils act in various ways. When used to counteract premature expansion of the lung, the incompressibility and the slow absorbability of oil in the pleural sac help to maintain compression. When directed against tuberculous pleurisy, the leukocytic and fibrinous reaction called forth by the irritating oil must be beneficial; perhaps the oxygen supply of the bacilli is curtailed; and certainly the restraint on the freedom of movement of pus in a large pleural cavity must inhibit infection. The fibrosis which results from the pleural reaction to oil has been relied upon to cause stiffening of the mediastinum when bowing of this membrane stands in the way of a satisfactory compression of the diseased lung. The fibrinous reaction of the pleura to the presence of oil has led to its employment to close bronchial fistula.

Indications

(1) Maintenance oleothorax. The best results are obtained when oleothorax is established to overcome premature expansion of the lung.

(2) Disinfection oleothorax. Oil is rarely used against serous pleurisy. In one patient the fluid, which was swarming with tubercle bacilli, remained serous for many months and every refill with air led to the formation of a subcutaneous

nodule. Oleothorax has been a distinct advantage over pneumothorax in this case. Neither should oil be injected in every case of purulent tuberculous pleurisy, for many of them are benign and, in addition, oleothorax itself is not free from danger. Yet, when the infection is exerting a general toxic effect and when the fluid is continually reforming, oleothorax is generally a very satisfactory substitute for pneumothorax. In addition, it usually stops the re-inflation of the lung, an effect very desirable in many of these patients. When the pleura is secondarily infected with pyogenic bacteria other antiseptics are more reliable.

(3) Compression oleothorax. When, with pneumothorax, the pulmonary cavity has not been closed and other surgical measures seem to offer no benefit or are inadvisable, the pleural cavity is filled with oil and its pressure is gradually increased. It is sometimes possible by this means to collapse the cavity.

(4) To make rigid a mobile mediastinum. The oil here acts by causing a definite pleurisy.

(5) Bronchopleural fistula. If the opening is thought to be small (intermittent expectoration of a a small amount of dye or pus identical with that obtained from the pleural cavity, or by direct observation through the thoracoscope) oleothorax cautiously applied may lead to success. When, however, the perforation in the lung is evidently large, most operators would reject oleothorax. Lawrason Brown recently had an instructive case. The pneumothorax (non-therapeutic) was complicated by a persistent bronchial fistula which could not be seen on the surface of the markedly collapsed lung examined thoracoscopically. No effusion had occurred. The injection of a small amount of oil was followed by a small effusion, the fistula closed and the lung is expanding nicely after having been collapsed for many months.

(6) Other minor indications which have been advanced should either be condemned entirely or accepted with great caution. It has been suggested that oleothorax may be substituted for pneumothorax when reactions after refills with air are objectionable, when pneumothorax refills must be given very frequently, especially in bilateral pneumothorax, when the patient lives at a great distance from the physician, etc.

Technique—The oil is autoclaved and the desired amount of gomenol is added afterward. The container is kept in a warm water bath so that the oil when injected is about body temperature. A syringe with a metal plunger, with large finger clasps, and which locks on to the needle or three-way adapter is desirable. I prefer one of 10 cc. capacity. The needle is usually 18 guage. The adapter locks on both the needle and the syringe and from its side opening rubber tubing leads to the container of oil. This tubing is replaced at times by a short piece of tubing connected to a pipette calibrated in centimeters for reading intrapleural oil pressures. By throwing the lever so that the oil in the sterile pipette is in communication with the oil in the pleural cavity one can read in centimeters how far the oil is drawn toward the chest or displaced upward. These readings are useful in at least a comparative way. . .*Substitution for uncomplicated pneumothorax*—After an ordinary air filling, inject 5 cc. of plain paraffin or vegetable oil. This may cause a reaction which may range from a slight soreness of the chest wall and low fever to a severe pleurisy with effusion which may even become purulent. No further oil refills are given while the reaction lasts. Usually no reaction occurs and, at each insufflation of air, oil in increasing amount is given, until the pleural cavity has been filled. While an air pocket is present, the pressure in it is observed with a water manometer. I usually use only one needle, withdrawing 10 cc. of gas after each filling of 10 cc. of oil. Occasional observations with the manometer show that the pressure does not change. When giving a large filling of oil and when approaching the completion of filling the chest, two needles are advisable, one for removal of gas and registering of gas pressure and the other for injecting oil. They are inserted near each other. Gas pressures are usually kept neutral or negative. Near the end of a complete filling it is very important to watch the gas pressure and to inject small amounts of oil at a time. A small amount of gas is usually left in the pleural cavity; it readily absorbs. I prefer to avoid the axilla, choosing rather the thicker muscled back or front of the chest to avoid reflux of oil into the wall. If the patient is emaciated or weak-muscled, a bandage firmly applied over a rubber sponge is advisable, especially if the oil is under pressure.

In the roentgenogram the shadow of the oil usually obscures that of the lung, so that one must rely on symptoms to determine the proper time for a refill of oil. Cough and expectoration may increase or the patient may feel and hear noises in the chest or feel the slight soreness associated with a negative pulling. Several patients have absorbed so little paraffin oil that they have needed no refill for four years. An injection of 50-100 cc. of vegetable oil may be needed every month or two at first.

If a compressive oleothorax is required to

close a pulmonary cavity, after a complete filling of the thorax one may instill 10-25 cc. of oil every two weeks. Here comparative oil pressure readings are useful. The desirable degree of pressure will be determined by mechanical, bacteriologic and symptomatic evidences. The danger of pulmonary perforation must be weighed against that of thoracoplasty, if the latter can be considered at all.

When a mobile mediastinum interferes with a good collapse, it is not necessary to fill the pleural cavity with oil. About 25 cc. of gomenolized paraffin will often produce a small effusion and lead to thickening of the pleura.

Substitution of pus with oil—Usually two needles are introduced, the lower for aspiration of the pus, the other high in the chest to irrigate the pleura with the chosen solution and to observe intrapleural pressures. The pleura is nearly always thickened and can withstand a large initial injection of oil, frequently 500-1000 cc. The pleural cavity is eventually completely filled. When pus reforms in more than slight amount and toxic symptoms persist, at refillings the pus is first removed. Sometimes the contaminated oil must be completely evacuated and a fresh instillation made. After the early weeks, as the toxic symptoms are relieved, I have seen a small residual amount of pus disappear slowly under the influence of 5-10 per cent gomenol in paraffin oil. On the other hand I have seen several patients in whom pus very slowly reaccumulated and had to be aspirated at intervals of 6-12 months but not on account of toxic symptoms. Patient perserverance is sometimes required but failure should be readily admitted and another treatment chosen. With better antiseptics at hand I have never tried oleothorax for the treatment of secondarily infected tuberculous empyema, in the absence of bronchial fistula.

Bronchial fistula—Some operators advise against ever applying oleothorax in the presence of this complication. I have never had a success. A small perforation offers the best chance of success. Two needles should be used to avoid overpressure in the gas pocket causing reopening of a temporarily closed fistula. Using small amounts of oil, Sergent has seen the perforation close, the lung re-expand, and the pus disappear. Large amounts of oil and undue pressure are dangerous. Thoracoscopic examination may show the position and size of the opening. The oil should not rise above this level. Vegetable oils are less irritating to the lung and are to be preferred to paraffin oil. It is interesting to remark on how many unsuspected bronchial fistulae have been discovered after injecting gomenol oil into the pleural cavity. A patient may smell or taste the aromatic oil when a dye previously injected did not appear in the sputum.

Cessation—When the result for which oleothorax was given has been obtained and maintained for a length of time which seems sufficient, the oil should be removed and air substituted. An argument in favor of vegetable oil is that the lung can usually re-expand as the oil is absorbed. In a patient who had gomenol-paraffin oil for three years, very little oil had been absorbed and the lung would not re-expand, the mediastinum becoming markedly retracted.

Results—Too much should not be expected of any treatment which is employed to replace a pneumothorax which is unsuccessful for some of the reasons mentioned above and very often in patients in whom thoracoplasty is not indicated. If the method were confined to patients whose satisfactory pneumothorax is being menanced by premature re-expansion of the lung and to those with relatively non-toxic empyema, whether of therapeutic or tuberculous pneumothorax, the results would be excellent.

In the series of Marie and of Fontaine, 24 of 42 cases of malignant empyema were controlled. In 50 cases of empyema, Matson found that the pus disappeared in 42, and that the lung was maintained in satisfactory collapse in 30. With maintainance oleothorax, 38 of 61 were effective and with compressive oleothorax 9 of 24 (Marie, Fontaine). With these two indications, Matson had success in 50 per cent.

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CRITICISMS ON TUBERCULOSIS MANAGEMENT*

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FOUR years ago, Catherine Smith, 21 years of age, was devoting all her time to the care of her invalid mother. The mother, who had been up and down according to her own judgment for several years, was slowly dying of tuberculosis. No attempt

*Prepared especially for THE JOURNAL-LANCET.

was made to protect the daughter from close and repeated contact with tubercle bacilli and so long as she remained apparently well no thought of her danger was entertained. Upon the death of her mother the girl was physically weary and, of course, emotionally upset. It was very difficult then for the family physician to tell the young woman that her waning strength was due to something more than the strain of her mother's care, and that her loss of weight had a more serious significance than insufficient sleep. The physician, wishing to spare Catherine continued anxiety regarding tuberculosis, hoped that with the release from the care of her mother she might improve without treatment. It was not until five months had passed that a mouthful of blood frightened the patient into seeking an examination. X-ray at this time revealed a well established lesion in the upper part of the right lung and tubercle bacilli were found in the sputum. However, as she smiled at the doctor and assured him she felt fine, he made light of it and assured her all would be well after a few weeks' rest. Three months apparently did a lot of good as was indicated by a gain of five pounds and by diminution of cough, although a little fever persisted. During this time the patient visited the doctor's office twice a week for a hypodermic of "serum" and for ultra-violet light. The return to normal life, however, carried her, in a few months, into a situation calling for more adequate treatment. The upper half of the lung was involved and there was unmistakable evidence of cavity. A little more than a year had passed since the physician first suspected tuberculosis and perhaps two years since the infection took place, but definite supervision, rigid discipline and adequate care had not yet been instituted. A little later, at the suggestion of friends, the patient was placed in the sanatorium. When the results of a thorough examination were explained to her she felt very critical of the kindly doctor who had conscientiously done what he thought was best under the circumstances. Artificial pneumothorax was done at once and was maintained over a period of six months with some clinical improvement, but it failed to collapse the cavity. Phrenicectomy and thoracoplasty were required to bring about an arrestment of the disease and another year passed before the case could be safely dismissed. The patient is now apparently well.

Now with the most kindly feeling toward the conscientious family physician and with the greatest respect for the vital role he will always play in the practice of medicine, I take this case as an example for criticism with the earnest hope its discussion may save some wasted years and loss of life and that the doctor may enjoy the abiding confidence of the community.

First: It would appear to be the duty of the family physician, much more than that of the specialist, to take up with the family of a patient the matter of infection of other members. In the case cited above, the Mantoux test was obviously indicated and a positive reaction would have led to a thorough examination before symptoms appeared. The Mantoux test is so simple to learn and to do, and gives us so helpful a clue that failure to use it will soon be classed as professional negligence. If the 0.1 Mg. proves negative, 1 Mg. should be used. If this is negative, the patient is not tuberculous. The confidence with which the physician may so advise the patient, and the comfort it gives the family far outweigh the effort required in applying the simple test. In the event of a positive reaction we can not say the patient is suffering with tuberculosis, but merely that he has at some time taken tubercle bacilli into his system. His present trouble, if any, may be simple bronchitis or whooping cough. The intradermal test will not differentiate. But if positive it does call for careful medical history; checking of the temperature; and physical, laboratory and X-ray examination. The assumption then, that the patient is or is not tuberculous, is based on definite information with which the doctor must fortify himself.

Second: Is it not also within the province of the physician in charge of the case to instruct the patient regarding prevention of disease? There is always an element of danger in every contact with the tuberculous patient, but the degree of danger can be so reduced as to be almost negligible. The physician with the aid of the Health Department, the visiting nurse or other agency can quickly teach the open case the simple rules by which the spread of disease may be controlled. Frank discussion with the patient of the importance of scrupulous care of the sputum will usually secure his co-operation. If it fails, the situation merits and demands stern discipline. Other members of the household must be taught the proper management of their relationship, and children must be prohibited from entering the room of the sick one. The fact that the little ones look and feel, and perhaps are, perfectly well is no excuse for subjecting them to repeated exposure to bacilli.

Third: Another point of criticism in the management of our case was the failure to explain to the patient and her father the gravity of her condition. It is deplorable that it should be such

common practice to keep the patient in ignorance. There is only one redeeming feature in this myopic policy and that is the transient comfort which is permitted the patient by the fallacy. How can one hope to secure a satisfactory result if the patient does not know what he is doing or why he is doing it? No one has a truer right to all the facts than the victim himself. Without a single exception the future is infinitely more promising if the physician and patient, together with the other members of the family, start off with a clear understanding of all the essential facts. Any deception, however well meant, will prove to be a menace which will lead the patient into difficulty and the doctor into disrepute. This conclusion is the result of long experience. For the moment it may be difficult for the patient to accept. Sometimes it is a terrible shock. Sometimes the patient breathes a sigh of relief in having definitely settled the matter which for a long time he has suspected and feared. Now the mystery is solved. Since the doctor, patient and family have frankly discussed all features of the case, it is quite safe to give the patient all the encouragement which is consistent with the facts. But every statement must be based on the truth. If the doctor gives assurance of improvement every time he calls how can he retain the confidence which is so essential to success when the patient recognizes that there is no improvement? Improvement is demonstrable—it is manifested in physical signs, in the X-ray, in the laboratory work and in the symptoms. A gain in weight is very encouraging to the individual and much can be made of it, but he should be warned that healing in the lung does not necessarily keep pace with the avoirdupois. Incidentally it should be recognized that fat does not cure tuberculosis and that there is not the slightest advantage in exceeding the standard weight. The point of this paragraph is that in the case under criticism the doctor should have told the patient and family the girl was definitely tuberculous; should have drawn an illustration of the shape and extent of the lesion; should have shown them the X-ray and immediately outlined the course of treatment which we have learned is imperative. By his kindly deception he was actually misleading the patient and aiding the bacillus. When the facts come out and the patient realizes the tragic loss of time and opportunity he fails to appreciate the physician's kind intent.

Fourth: For many years and in thousands of cases it has been amply demonstrated that *rest* is the chief therapeutic factor in the treatment of tuberculosis. Is it then through ignorance or through desire for profit that the patient is instructed to come to the office twice a week for a hypodermic of something or other and a few minutes exposure to the ultra-violet lamp? It is highly speculative whether these two details of office treatment have any benevolent effect. Obviously any possible increment of benefit is outweighed in a febrile case by the exertion incident to securing it. Furthermore, although we have been taught by experience of able men that rest, fresh air, and good food are the three prime elements in the treatment of this disease, we should also have learned that these important factors are of little avail without a fourth one. The fourth factor, equally important—indispensable in fact—is the rigid supervision of the case by a physician who knows what he is doing.

Fifth: The greatest adjunct which has been devised for tuberculosis in 25 years is Artificial Pneumothorax. Innumerable individuals with little hope of arrestment have been converted into progressively improving cases with every hope of success. In the case under criticism, this efficacious aid should certainly have been sought before cavity appeared. Cavitation can usually be prevented by collapse of the lung and if carried out before destruction of tissue has occurred, healing is immeasurably simpler. In the presence of cavity it often proves impossible to collapse the excavated area even though a thorough collapse of the lung be secured. It is a common experience, too, that adhesions between the lung and chest wall partly or wholly prevent collapse of the lung. This was true in the case of Catherine Smith. It is very distressing to the physician, and alarming to the patient, to discover that, although in the X-ray film the case appears amenable to pneumothorax, the method is practically useless because of extensive adhesions. Even the patient in such event readily sees that pneumothorax should have been done before. In the case under discussion phrenic exeresis and a two stage thoracoplasty have resulted in an apparent cure. This is undeniably a real achievement, but such radical treatment could have been avoided.

Finally: The doctor in the case of Catherine Smith was at fault in failing to suggest the sanatorium. With very few exceptions, all tuberculous patients who have spent a little time in well managed institutions smile at the thought of trying to take the cure at home. Whether the patient be wealthy or in poverty he is unfortunate if he cannot obtain at least a little sanatorium experience. The physician will discover, on the patient's return, that his follow up care

is far more satisfactory and the family will always be grateful for his far-sighted advice.

Two great purposes are accomplished in the institution. First: The lesion is far more readily brought under control. Second: The education obtained by the patient is such as is unobtainable outside. Thousands of patients in sanatoria all over the country bewail the loss of time and health occasioned by the delay in entering the institution. There are excellent state, county and municipal sanatoria throughout the land for the benefit of those who are out of funds, and there are well managed private sanatoria for those who can afford to pay.

Tuberculosis is still a menace to life—treacherous, in that, even when advanced, it may permit the patient to feel that all is well, yet responding, sometimes incredibly, to thorough understanding and proper management of the case.

PLEURISY*

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THERE is considerable difference of opinion, at present, as to whether pleurisy is a disease, or merely a symptom. Dorland defines pleurisy as "a disease marked by inflammation of the pleura, with exudation into its cavity and upon its surface." Osler considers pleurisy a disease. According to Anders, pleurisy is "an inflammation, either local or general, of one or both pleural membranes." Whether considered a disease, or a symptom, pleurisy is a distinct entity and a very common affection.

Etiologically, pleurisy is divided into primary or secondary. Pathologically, we have localized and general pleurisies, and these may be divided into "dry" and "wet." All of these forms are subdivided into acute or chronic according to the course of the pleurisy.

By primary pleurisy we mean an inflammation of the pleura occurring in a previously healthy person. This condition is exceedingly rare and many so-called primary pleurisies are afterwards proved to be really secondary. By secondary pleurisy, we mean an inflammation of the pleura due to extention of an inflammatory process in the lungs, pericardium, mediastinum, and occasionally the liver. The pleura may also be infected by way of the blood stream in cases of general septicemia.

Pleurisy is usually associated with pulmonary disease. Very rarely do we have any acute or chronic disease of the lungs without pleural involvement. Hence we find it a common complication of lobar pneumonia, broncho-pneumonia, lung abscess, pulmonary gangrene, emboli, infarcts and mycotic infections. Some cases of secondary pleurisy are rheumatic in origin, but these are few and far between. Anders states that "in all forms of pleurisy the direct cause is various micro-organisms, or their irritating chemical products." In the great majority of instances, pleurisy is secondary to some pre-existing condition. While a primary pleurisy can be produced by exposure to cold, the only other condition, according to Landis and Norris, which is apt to produce a primary pleurisy is a traumatic injury to the chest wall.

Most authorities agree that there is no such thing as a primary pleurisy. They maintain that these so-called ideopathic, or primary pleurisies are really tuberculous in origin and are merely symptoms of an underlying latent, or active tuberculous condition, generally in the lungs. Vest, in the *West Virginia Medical Journal* for July 1924, says that "pleurisy, especially with effusion, is usually tuberculous when primary." Speaking of the modes of onset in pulmonary tuberculosis, Riviere says, "an onset with pleurisy forms, as a rule, a striking picture, and here disease may remain quiescent, and lull suspicion for years after the pleural attack."

"Primary, or ideopathic pleurisy, was formerly considered of frequent occurrence, but within the past decade, it has been shown conclusively, that the great majority of apparently primary pleurisies are tuberculous. A pleurisy with serofibrinous exudate, especially one which has developed insidiously and with no symptoms, the probability of its being tuberculous in origin is almost a certainty." This assertion of Norris and Landis concludes with this statement, "so long as there is doubt as to which are really primary and which are secondary to a latent tuberculosis it is unwise to assure the patient that the trouble is trivial in nature."

Riviere says, "The more delicate have our methods of investigation become, the higher is the percentage of primary ideopathic pleurisies proved to be tuberculous. Not only is pleurisy of tuberculous causation, but it is also followed in a large number of cases by pulmonary disease. In some cases, no doubt, a lesion already existed in lung or glands, but it must be remembered also, that the lymphatics of the pleura pass to the hilus glands, and these will be readily

*Prepared especially for THE JOURNAL-LANCET.
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rendered tuberculous and hand on infection, stage by stage, to the lung itself. In most cases (over 85 per cent) symptoms of pulmonary disease develop within five years of the pleurisy, and it is necessary to keep all cases under close observation. After that interval has passed, the likelihood of disease occurring appears small."

Laudauzy recognizes 98 per cent of all so-called simple pleurisies as tuberculous; Stintzing 50 per cent; Jacob and Pannintz, 10 per cent; and Sokolowski only 2.8 per cent. Bandilier and Roepke state 50 per cent most nearly correct, "since extensive statistics show that ideopathic pleurisies are in about half the cases tuberculous, and regularly so during the first five years of life. The pleurisy and afterwards manifest signs of lung tuberculosis, are to be explained by a latent lung tuberculosis, which first produces pleurisy and later shows itself in its true form."

Miller and Hamon, in writing on their experiences with ex-service men, covering a period of four years, state that of 78 patients giving a history of pleurisy with effusion, 78 per cent were definitely tuberculous.

Stewart makes this statement, "Ten years ago pleurisy, especially with effusion, was as clearly diagnostic of pulmonary tuberculosis, almost, as hemoptysis. Ninety per cent or more of pleurisies with effusion were considered definitely tuberculous and the others most suspicious. Pleurisy, ten years ago, was tuberculosis. Pleurisy today is pleurisy. After all has been said, however, pleurisy, especially with effusion, and especially if recurrent, though not absolutely conclusive, is one of the most convincing elements in the diagnosis of tuberculosis. It should, indeed, make the diagnosis and determine the prognosis—unless an alibi can be proved."

According to Pottenger a "pleural effusion is very commonly the first indication of tuberculosis. A careful history gives you a slight cough, 'cold,' loss of appetite, malaise, mouthful of blood, etc., a few weeks or months previous to effusion."

Fishberg maintains that "pleurisy cannot be considered as a predisposing cause of tuberculosis because it appears that it is essentially tuberculous. This means that it is not predisposing to phthisis, but that the patients with pleurisy are actually tuberculous from the start."

Otis says, "Pleurisy is so often secondary to tuberculosis that a careful examination should always be made of the lungs to detect a primary tuberculous focus. If there is an effusion and no evidence of tuberculosis, animal inoculation may be necessary to determine the nature of the fluid."

Nobel and Steinbach affirm "that in nearly all cases of pleurisy with effusion in children, not recently having suffered from the infectious diseases, the etiological factor is the tubercle bacillus."

Osler, in his usual conservative manner, writes that a majority of the cases are tuberculous, stating that the bacillus tuberculosis is present in a very large proportion of all cases of primary or so-called ideopathic pleurisies.

Pathologically, the terms "localized," "general," "dry" and "wet" are self explanatory, and I am sure we are all familiar enough with the terms "acute" and "chronic" without further definition of same.

While no age is exempt, pleurisy is generally found in adults. It is more common in men than in women. Calmette states that "Serofibrinous pleurisy is noted but rarely in young children. It is not common until after the fifth year, and is particularly common about the age of 20."

There are many forms of pleurisy commonly encountered in daily practice. There is the fibrinous pleurisy, a form with a dry fibrinous exudate which is usually chronic. There is the plastic form with soft semi-solid exudate in layers. These two forms are the ones commonly known as dry pleurisies. There are also, different kinds of wet pleurisy depending upon the nature of the fluid. In serous pleurisy there is a free exudate of serum; hemorrhagic pleurisy is one with a bloody exudate; chyliform has a milky fluid; and purulent pleurisy has a pus exudate.

Pneumothorax—air or gas in the pleural cavity—while not a pleurisy, at times is complicated by the addition of fluid, or blood, and takes on the nature of a real wet pleurisy. We then have a hydro or hemo-pneumothorax depending upon the nature of the fluid mixed with the air or gas.

Dry pleurisy may be acute or chronic. In the acute form the pleura first becomes reddened with a soft, grayish lymph exudate. This is the dry stage and the process may stop here, though it may progress to the effusion stage with a copious exudation of serum.

In the chronic stage, we find usually a layer of fibrinous material between layers of pleura. This material has been gradually converted into a layer of firm connective tissue. This process goes on at the base of the lungs usually.

The symptoms of dry pleurisy are very char-

acteristic. The general symptoms are mild and do not compare with the local signs, and not infrequently, cases are so mild as to be attended by few, if any, subjective symptoms. Occasionally there is extremely high fever, a distinct chill, with prostration and very severe local and general symptoms. These cases usually have a fatal outcome, but fortunately they are rare.

"Painful feelings of pressure and constriction in the chest with irritating cough, especially over an apex of the lung, are usually due to a localized dry pleurisy," according to Bandilier and Roepke. Pain is increased with each inspiration, and respiration is intentionally restrained, and cough repressed. A very characteristic sign is that the patient nearly always lies on the affected side. Fever is slight, or absent, though if occurring during the course of an active tuberculosis fever is generally increased.

Percussion, as a rule, gives no signs.

Early in the disease, inspiration sounds may be increased though usually breath sounds are weakened. A definite friction rub is generally heard on inspiration and expiration, and frequently can be felt.

When the breath is held, this pleuritic friction rub is absent, and cough does not influence the rub, though pressure on the intercostal space often increases it.

The differentiation from intercostal neuralgia, the principal condition simulating dry pleurisy is easy. In intercostal neuralgia the pain is increased in bending the body on the affected side, while it is diminished in pleurisy. The pain is usually sharply localized and follows the nerve route in neuralgia, and is not so localized in dry pleurisy.

The treatment of acute dry pleurisy is simple. Rest in bed, light diet, and relief for pain and cough. Often rest in bed is sufficient. If pleurisy is uni-lateral, strapping the chest often affords relief. Postural rest, that is, lying on the affected side relieves the pain and lessens cough. In mild attacks, salicylates are of value, though codein and even morphine may be necessary if pain is severe. Hot packs to the affected side are recommended by some, but personally I prefer ice packs. Tincture of iodine and blisters are of no account; neither is sweating the patient. Keep in bed for a week, after the attack has subsided and gradually let patient up. Light diet in early acute stage, but as symptoms subside return to normal diet.

The "Infra-Red Lamp" has been used to relieve the pain in acute dry pleurisy. It also produces counter-irritation. If properly used it is of value. Natural helio-therapy and ultra-violet light are not of much therapeutic value.

Bullock has recently advocated treating acute dry pleurisy with artificial pneumo-thorax. This appears to be a very logical form of therapy. By the introduction of about 200 cc. of air we separate the layers of inflamed pleura, relieving the pain, and allow the inflammatory areas to heal without the formation of adhesions.

Dry pleurisy usually runs a favorable course, though very frequently dry pleurisy is a forerunner of effusion, occasionally of a hemorrhage, a pneumothorax, and in a patient with tuberculosis, we often have a sudden "lighting up" of an old apparently healed tubercle in the lungs. As effusion generally follows dry pleurisy, wait awhile before stating prognosis.

One attack predisposes to subsequent attacks with consequent pleural thickening and formation of adhesions, often resulting in chest deformities with displacement of mediastinal organs. At times, the diaphragm becomes attached and immobilized.

Klebs insists that recurrent attacks of dry pleurisy are to be considered as a sure sign of tuberculosis and treated as such.

Wet pleurisy, or pleurisy with effusion, as it is better known, quickly follows upon exposure to cold, or wet, or injury to thorax, and often follows a dry pleurisy. The most common form is chronic tuberculous pleurisy occuring in patients with pulmonary tuberculosis, and, more often than is supposed, it is secondary to a tuberculous peritonitis. Cases in which the tuberculous focus perforates the pleural sac, producing a pyopneumothorax have been reported. Hemorrhagic effusions occur in tuberculosis, cancer of lungs or pleura, in cachectic conditions such as scurvy and hemorrhagic small-pox; exceptionally in cirrhosis of the liver, aneurism of the aorta and chronic nephritis.

In pleurisy with effusion, there is an abundant serous exudate with formation of fibrin on the pleural surfaces. In some cases there is very little fibrin, while in others it may be a thick mass. Generally a straw colored fluid, it may be almost any color. The amount of the effusion varies. Osler mentions as much as four litres.

While the onset may be insidious with very few symptoms, it usually begins with stabbing pains in the side, an irritative cough, shortness of breath, a high fever, usually intermittent, low in the morning, rising later in the day. The pulse is accelerated corresponding to the degree

of the fever. Tachycardia is common and even cyanosis is found. Dyspnoea is present, at first due to pain, but later caused by fluid compressing lung tissue. The shortness of breath varies upon the rapidity of the effusion and the condition of the other lung. Slowly developing fluids, even though large in amount, produce very little difficulty in breathing if the other lung is in good condition.

Large effusions may form unnoticed by the patient, who may complain only of a few general symptoms, as heaviness, loss of appetite or gastric distress. While effusion is forming, urinary secretion is diminished.

We find the affected side larger than the other with the intercostal space obliterated, or bulging if the effusion is large. The affected side is motionless, and there is a sensation of hardness and resistance on palpation. Large effusions may reach as high as the clavicle in front and spine of the scapula behind.

The percussion note over the effusion is dull and flat, and, as the lung tissue is compressed above the fluid, we here get a tympanitic note. Many authors speak of a shifting of the upper level of the fluid according to the position of the patient. Fishberg claims this occurs only in a hydropneumothorax. Dunham, in 1917, has shown that "as a general rule it can be stated that pleural effusion does not move and that movable dullness over the thorax means hydropneumothorax."

In pleurisy with effusion we find no friction rub. Breath sounds are feeble or absent though later on in course of the effusion, distant bronchial or tubular breathing is heard. Vocal fremitus is very weak and in most cases is absent over the effusion. Bronchophony and even whispered pectoriloquy is heard, and at times, fine rales and crepitations. No sound passes through the fluid to the ear when the patient coughs or speaks.

The displacement of internal organs depends upon the amount of the fluid. The heart is drawn over to the sound side, the diaphragm and liver are lower, and mediastinum is displaced to sound side.

Bacelli's sign, i. e., "on auscultation the whispered voice is heard through serous fluids, but not through purulent," is of some value, but is not absolutely reliable.

Stereoscopic X-ray films, or fluoroscopy, should be used in all cases of suspected effusion, whenever possible, for diagnostic purposes. It is also of value to do exploratory puncture to determine nature of fluid, and for laboratory purposes to determine the organism present. Exploratory puncture is dangerous first few days of effusion, unless some serious reason for it. During the febrile stage, it is liable to produce a bacteremia.

While the X-ray is of doubtful value in diagnosing dry pleurisy it is far superior to physical examination in effusion. It permits us to follow the course of the pleurisy noting the rate of absorption or increase in the fluid. X-ray shows that fluid in chest casts a deep homogeneous shadow in the affected part and the diaphragm is immobilized. The upper limit of the shadow passes gradually into the luminous part of the lung tissue above, and displaced organs are clearly shown out of their natural positions.

During the stage of absorption there is a decrease in the size of the affected side with a return of the normal appearance and shape of the chest and the respiratory movements. Dullness gives way to a normal percussion note. Breath sounds reappear above and then lower down until the base is reached, and these sounds gradually assume their normal tone. With the disappearance of the fluid the two rough pleura come together and we now get a pleural friction rub. Very frequently these rough edges of pleura become attached to each other forming adhesions that bind the lungs and render them to some extent immobile. This immobility depends upon the number, location and strength of the adhesive bands.

There are three pulmonary conditions we must bear in mind when considering pleural effusion, and rule out before a positive diagnosis can be made; these are lower lung infiltrations, pneumonia and intrathoracic tumors. In intrathoracic tumors we have pain in the arm and shoulder, dilated veins, oedema of skin, and a slowly increasing irregular area of dullness with no fever; none of these signs in pleural effusion as a rule. In pneumonia, we have increased vocal fremitus, while weak or absent in effusion. Pneumonia is also distinguished by its acute onset, chill, fever, bloody sputum and lobular areas of dullness.

Effusion is differentiated from basal pulmonary infiltration by the presence of Grocco's Triangle, which is not found in infiltrations. This is a triangular area of dullness on the sound side, with its sides formed by the dome of the diaphragm and vertebral spine. This comes and goes with the effusion.

In treating effusions, rest in bed with light diet and restriction of large amounts of fluid may be sufficient. Milk and salt for diuresis, but no dras-

tic purges. If dyspnoeic, elevate on back rest. As in dry pleurisy, sweating and blisters are of no use and deep breathing should be restrained. Relieve cough and pain with salicylates, codeine, or even morphine if necessary. Never use iodides as it is too risky. In recent years diuretin has been recommended for its diuretic effect.

Aspiration is not always necessary. Many cases will absorb the fluid if put at rest. There is too much meddlesome interference with pleural effusions. Personally, I think no patient should be aspirated unless the X-ray proves conclusively there is fluid present, and then take your time. Trousseau says, "We should aspirate only in very large effusions, those endangering patient's life or in effusions showing no tendency to absorb." The old saying is "never bother fluid till fluid bothers you."

If aspirated, be sure to leave some fluid to lessen the danger of shock. It is best to replace all fluid removed with air or sterile oxygen, as in artificial pneumothorax. This lessens the formation of adhesions. Many French physicians blow out the fluid. Air under pressure is admitted above, with canula below for the fluid. This also prevents adhesions.

If either of these methods is used, all the fluid may be removed, but the air or gas should be injected a second time.

Autoserotherapy has been recommended in place of aspiration. Here the danger of reinfection must be considered, but this is minimized by not withdrawing the needle from the patient's chest. When the point of the needle reaches the subcutaneous tissue, turn it at right angles and reinject the fluid into the subcutaneous tissues. Five or ten cc. can be injected every other day. This increases diuresis and absorption of the fluid.

I have had very good success in treating effusions with calcium salts combined with a "salt free diet."

Danzer has recommended the use of Thyroxin in treating pleurisy with effusion and he suggests it be given when spontaneous reabsorption is delayed.

There are two stages in wet pleurisy—febrile and non-febrile. The febrile lasts generally two or three weeks when the effusion occurs. Subsidence of the inflammation with disappearance of the fluid is the non-febrile stage. Exudation may be rapid with rapid absorption, but usually both are gradual.

Effusion cases usually recover; death from pleural effusion being very rare. The duration and prognosis depends largely upon the cause of the fluid and the general physical condition of the patient. Simple exudative pleurisy invariably has a favorable prognosis. Serous effusions are more favorable than the hemorrhagic or the purulent. Recovery is the rule, though cases where a fistula developed, resulting in a pneumothorax have been reported.

In tuberculosis, pleural effusions usually remain for months, and often in these tuberculous patients we find a polyserositis of the other serous membranes, as pericardium, peritoneum and even the meninges.

Though bronchiectasis is a frequent complication of pleurisy with effusion in children, the tendency to recover is more pronounced in children, than in adults.

Continued absence of bacteria in an effusion calls for a diagnosis of tuberculosis and Penzoldt insists "that all effusions should be treated as a lung case with latent tuberculosis." In every case, always carefully examine the other side, as often active tuberculosis develops, or lights up again, in the opposite side from the fluid.

Fluid in active tuberculosis has been held to have a beneficial effect upon the tuberculosis process, due to the compressing of the lung, bringing to rest the affected area. This is still a disputed question and statistics are presented by both sides.

I have seen many of these cases, and while many have benefited at the time, the distress from consequent adhesions has made them forget all their other troubles. Since the introduction of replacing the fluid aspirated, by air or gas there is no doubt these patients have been benefited as no adhesions are formed. Any method that will prevent the formation of pleural adhesions is to be used in preference to all others.

A rare form of wet pleurisy is the encysted form. This is an effusion localized in consequence of adhesions between pleural membranes. There may be two or more pouches without communication, and they may occupy any part of the chest. The signs and symptoms are very unreliable and without X-ray films, diagnosis is very untrustworthy. Exploratory puncture has been advised in these cases for diagnostic purposes, but seems unwarranted when X-ray films, or fluoroscope is at hand. The treatment of encysted pleurisy is the same as for the usual serous effusions and full recovery is the rule. Hemorrhagic and chyliform exudates and pneumothoraces run similar courses and the treatment is along similar lines.

There are four forms of localized pleurisies

that are fairly common and deserve a few words here. We will not discuss mediastinal pleurisy as it is extremely rare. Pericardial pleurisy is a left-sided dry pleurisy of the part overlapping the pericardium. There is pain near the heart, palpitation and shortness of breath. Friction sounds are heard near the heart, generally near the apex, and partly obscuring the heart beats. Radiographic examination shows bands of adhesions on left side of heart forming a fine network. The heart shadow is thickened and these fine bands move with its pulsations.

Interlobar pleurisy is a result of the gluing together of two edges of pleura consequent upon previous inflammation. These pleurisies are generally purulent or sero-purulent though serous fluids are found. If large, a bulging in the side of the thorax can be seen. Many think that the "annular rings" seen on X-ray films of the chest, are localized interlobar pleurisies. Most of these pleurisies are discovered only by the X-ray. In acute cases the onset is sudden with severe pain, chills, fever, cough and dyspnoea. At first nothing is found. Later a band of transverse dullness is felt. The dullness follows the interlobar fissure forward from the vertebra, till lost in liver or heart dullness. X-ray shows this band very distinctly unless shadowed by old pleuritic thickenings. Fifty per cent of these pleurisies burrow into the lungs and the patient spits up in gushes. The patient even tastes pus and there is a foul odor to the expired air. An acute toxic onset, with a band of dullness between two resonant areas, expectoration of mouthfuls of foul purulent sputum, and the typical X-ray picture make the diagnosis not unusually difficult.

Apical pleurisy is very common and is frequently overlooked. Many cases called tuberculosis with negative sputum, and many "suspected" cases are really undiagnosed apical pleurisies. The onset is generally insidious with a slight fever, dry cough, pain in the chest and shoulder and often loss of appetite and weight. Though suggestive of active tuberculosis physical examination reveals nothing pathognomic of tuberculosis. The only characteristic sign found on auscultation is a friction sound with no change in breath sounds in the supraspinous fossa of the affected side. The X-ray often gives no evidence of this apical pleurisy, though generally we find a thin band called an "apical cap." This friction rub is very superficial and soon disappears, but appears again during an exacerbation of the pleurisy. Sergent points out two other signs of apical pleurisy. (1) Inequality of the pupils and (2) swelling of the glands in the supraclavicular fossa. These signs may be found singly or in combination. Apical pleurisy has a tendency to recur and many attacks are found in the same patient. Generally it runs a benign course with full recovery in one to three months.

Diaphragmatic pleurisy is a definite entity, and may simulate abdominal disease, especially if purulent. Localized between the base of the lung and the diaphragm we do not get the usual signs of pleurisy. Usually we have an acute onset with pain in the side, painful vomiting, slight difficulty in swallowing and occasionally a severe dyspnoea. The affected region is very tender, with pain in the neck along the course of the phrenic nerve, and often gastric pains and hiccoughs. According to Osler, "marked subjective symptoms with slight physical signs are very characteristic of diaphragmatic pleurisy." Radiographic examination is necessary in this case. We find generally a diminution in the movement of the diaphragm and a band of adhesions is seen. There is a bending of the diaphragm, often a thickening of the diaphragm, and also the complemental space is small and indistinct. No friction sounds are heard. The two areas of tenderness are posteriorly along the twelfth rib of the affected side, and in the neck along the ridge of the trapezius muscle. Occasionally there is rigidity of the abdominal muscles of the affected side.

All of these localized pleurisies eventually recover and the treatment is the same as for serous effusion cases.

In conclusion, we will very briefly consider chronic pleurisy, which occurs in both dry and wet forms. Chronic dry pleurisy usually follows an acute wet pleurisy due to the absorption of fluid and the formation of connective tissue. This is a very common condition in pulmonary tuberculosis, and also follows cases of empyema. It is generally basal and need cause no worry as the effects of chronic dry pleurisy are not serious. We also find this condition following traumatic injury, as in gun shot or stab wounds of the chest. There is also a type of chronic dry pleurisy that is insidious in onset and the signs and symptoms are so slight that the patient knows very little about its onset, and a friction rub heard, and often felt, is the first sign of the condition.

Chronic wet pleurisy is usually tuberculous and is common in the course of chronic pulmonary tuberculosis. These are the cases in which the fluid remains for months, and even years, according to Osler, without undergoing any change, or becoming purulent. These are similar to cases

of the acute type except for the severity of symptoms. In these chronic wet pleurisies, if there are no subjective symptoms of distress or fever, leave them alone as these are the cases where repeated aspirations bring about infection and turn a benign condition into a true empyema.

THE AFTER-CARE OF THE TUBERCULOUS*

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THE average tuberculous patient regards his treatment completed when he receives his discharge from the sanatorium or is advised by his attending physician that his tuberculosis has become apparently arrested. Thus, after-care as a correlated part of the recovery program becomes the one important obligation which is rarely satisfactorily observed.

The general opinion has prevailed for many years that a comparatively few months spent in pursuing a rest regimen was all that was necessary to equip the patient to return to full work. Consequently, thousands of but slightly improved, not even quiescent, patients were discharged from our sanatoria in a vain hope that they were able to take their usual places in the world of work. That a large proportion of these partially recovered patients soon succumbed to exacerbations of their persistently active tuberculosis was universally accepted as the inevitable outcome. Soon arose the embarrassing question, "What is the worth of sanatoria?" No one seemed to have a reliable answer. However, the natural reaction to the challenge was to lengthen the time of sanatorium residence. When this was accomplished, a noticeable improvement in the medical result was soon apparent. Nevertheless, far too many conscientious "cure-chasers" still failed in the effort to return to any vocation without causing serious damage to the impaired lung.

About twenty years ago, collapse therapy by induced pneumothorax came into more general use and doubtless averted the threatened breakdown of the entire sanatorium system. Other forms of lung surgery were devised which materially contributed to better results in therapy. Nevertheless, the mortality rates were not declining in accord with the apparent possibilities and the wiser leaders began to envision the weakness of our accepted therapeutic measures. Only within the last decade, did the need of more adequate training for his future life become apparent to the patient while in the sanatorium and the necessity for a satisfactory followup system become thoroughly appreciated by physicians, nurses and social workers.

Much interest was created in various projects in rehabilitation and considerable enthusiasm was aroused in various countries in an attempt to solve this perplexing problem. Worthwhile accomplishments were genuinely disappointing to the proponents of this new idea of continuing treatment under medical supervision after sanatorium discharge. Such outstanding institutions as Papworth Village demonstrate a solution to the problem, providing farsighted trained physicians are available for directors.

Futhermore, considerable experience was necessary before the sanatorium medical staffs fully appreciated the fact that the broad scheme of rehabilitation must be clearly in mind on the very day of admission of the tuberculous individual to the sanatorium. A practical application of this conception has been the introduction of thoughtfully prescribed work into the institutional curriculum. Primarily, graduated exercise and work should be regarded as a part of the treatment, and intelligently accepted by the patient as a means of improving the general well being. Secondarily, the work scheme must be considered a valuable means of restoring the capacity for work in preparation for the day of discharge, when the expatient must again earn his living and care for his dependents. The attending physician must be the sole judge of the nature and amount of work to be attempted by the patient. This fundamental precept cannot be overemphasized.

The most important feature of any comprehensive rehabilitation scheme is to begin it early. A social analysis, diagnosis and prognosis is essential upon admission to the sanatorium, when a plan of social treatment should be formulated, based upon the needs and capabilities of each individual patient. If this analysis is deferred until the time of discharge, it is too late for the best interest of the patient. Since those in the far advanced stages of tuberculosis cannot be considered for any form of social treatment, custodial care of the chronically tuberculous must be accepted as the only alternative. Society has admitted its responsibility to the sick individual by furnishing sanatorium care, yet there is even a greater responsibility to return him to employment with his physical and mental state as unimpaired as possible.

The theoretical plan of social rehabilitation, first tried in Minneapolis, deserves special recog-

*Prepared especially for The Journal-Lancet.
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nition as a scheme designed to cover all aspects of the situation. It may be described briefly, as follows: A Case Conference Committee is set up, composed of the clinic physician, the family physician, the sanatorium medical director, the social worker, the visiting nurse, the employer, the vocational rehabilitation supervisor, and the director of adult education. These represent the medical, vocational, educational and social fields.

This group plans for the patient's future at the time of his admission to the sanatorium. The consultation of specialists must be a composite of medical judgment, employment possibilities, and an epitome of capabilities and vocational adaptability. The economic phases of the situation must receive careful consideration. Frequently the employer is in a position to suggest practical educational therapy. The critical analysis often reveals information of the utmost value such as special aptitude, lack of education, need of supervised work or character training so necessary in the patient's after life. All of the success of this guidance is dependent upon expert medical treatment both during and after sanatorium residence, and no matter how skillful the medical service may be it is not sufficient unless reinforced by adequate social supervision.

From a practical point of view a successful after-care scheme requires careful consideration of the following factors: First, the patient, to fully understand the reasons for certain details in treatment, should acquire pertinent knowledge of the anatomy and physiology of the lungs, as well as the epidemiology, symptoms, complications and management of tuberculosis, to the limit of his capacity. This can best be accomplished through competent, systematic instruction in this field given by the medical staff of the sanatorium. Second, there must exist the most zealous co-operation between the physician and the patient, featuring meticulous attention to the essential details of the institutional regimen, founded upon a mutual understanding of the paramount importance of rest and exercise. Third, there needs to be more general appreciation of the fact that tuberculosis is as much a social problem as a medical problem, therefore the specialized machinery necessary to carry out the social treatment, supplementing the medical care, should be instituted in every sanatorium worthy of the name. Fourth, a detailed lifetime program should be prepared for each individual patient, taking into consideration the extent of his disease, the degree of arrestment, the social and financial status, the intellectual attainments, and all other pertinent factors, so that a comprehensive scheme of rehabilitation may be advantageously applied. Fifth, the foundations of the knowledge of medical care and social treatment, acquired while a patient is in the sanatorium, must guide and serve him throughout his entire future life.

The general principles upon which the recovery of the tuberculous patient depend are so simple that universal observance of these fundamental points should mark the next great advance in our campaign against tuberculosis. Finally, the judicious combination of all the intricate factors, based upon medical experience, which arrest the disease and return the patient to a full life of usefulness, must be utilized to accomplish the physical and economic recovery.



The History and Function of the Athletic Team Doctor*

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THE RELATION of the medical man to physical education and sports during the past fifty years represents one of the most interesting chapters in our athletic history. Before 1875 competitive athletics in colleges were casual and informal. The contests were limited in the main to teams in the same institution with an occasional excursion abroad to meet the team of another college on its own ground.

During the following fifteen years there came about a profound change in the development of sports. Interest in intercollegiate contests grew very rapidly, while at the same time and as a consequence there was a marked lessening of interest in contests among teams within the college. These changes were particularly marked in baseball, football, rowing and track. The interest and energy of the students tended to focus on the selection and preparation of a team or crew to represent the institution in contests with rival colleges. Trainers and coaches were employed; the one generally from the ranks of professional athletes, the other from a group of recent graduates who had proved themselves skillful in a given sport. Still other alumni served as advisors in the various sports or as diplomatic agents in relations with similar representatives of other institutions. In the meantime the authorities of the institutions themselves played a very small part in these affairs.

These intercollegiate contests made necessary conferences by students about rules of sports, eligibility of athletes, professionalism, management of finances; and a faculty conference, the first of many so far as I can learn, was brought together in 1884 to discuss athletic problems—their control and their relation to the life of the college. I suspect that "overemphasis" was born at this conference.

In a surprisingly short space of time these activities and interests grew to proportions and assumed an importance that represented a new element in American college life and changed in fundamental ways student attitudes and outlook. It is only fair to say at this point that the students and young alumni who were in the main responsible for promoting and guiding this new phase of college life and relationships with other colleges did a better job than is generally realized.

As training for sports became more rigorous and contests more frequent and intense it gradually became evident that the effects on individual students were not always good. The aggravation by athletic training and competition of some unrecognized disability of heart, lungs or kidneys; an injury that served as a serious handicap for an indefinite time; or even a death during or shortly after a contest called the attention of everyone interested to some of the dangers and disadvantages of intercollegiate athletic competition. Articles of criticism and defense began to appear in the press and in the periodicals. The newspaper critics and college faculties were suspicious of this new thing and were afraid of it for any one of a number of reasons, many of them justified. The defenders of sports, on the other hand, were having the time of their lives in this attractive activity, and so far as injuries were concerned, counted the game worth the candle.

This was the "gold rush" period in college athletics—unstable athletic organizations due to frequent changes in undergraduate personnel and consequent changes in methods and policies; pioneer facilities for games; distrustful attitudes and relations; inadequate and unstable codes of rules, all tended to conceal for the moment the fine gold of sportsmanship and generous competition.

Consequently the athletic situation as it developed in the 80's and 90's characterized as it was by an increasing number of injuries to contestants, and other objectionable features, represented a challenge to both the academic authorities as such and to the men, doctors and others, who were interested in the aims and results of physical education programs. How did these two groups meet the challenge? The answer of the academic authorities is contained in the records of many conferences and much legislation on rules and regulations which need not concern us at this time. As regards the

*Presented before the American Student Health Association, Chicago, Ill., December 28, 1933.

medical men: The honest answer, however reluctantly given, is that this group from whom one would be justified in expecting a useful service really exercised very little influence on those phases of athletics that were responsible for the occurrence of injuries and other disabilities.

There were three outstanding reasons for this failure on the part of the medical men to function effectively in this situation. In the first place the doctors, who were in what appears to be a strategic position to correct undesirable practices in training and in contests, were largely imbued with the Swedish and German theory that physical activities, gymnastic or athletic, were to be judged by the contribution which they made to **good health, symmetry of body** and **strength of muscle.** For example: In 1887 one who afterward became one of the eminent surgeons in the country recommended—"exercise for symmetrical development" and stated that "the aim of physical training is to enable the student to perform greater feats of strength." He advised further the avoidance of intercollegiate sports because of bad training, undesirable associations and evil influences.

Also educational institutions with few exceptions in those days made no provision for the medical care of students who were sick or injured. The medical members of the faculties therefore were not in the active practice of medicine, and as a result their influence among the students in the field of practical medicine was very slight.

The final reason, perhaps even more important than the others, why the doctors exerted so little influence, was the fact that the control of competitive athletics was for all practical purposes in the hands of alumni and undergraduates who were in this field pretty completely independent of the institution with which they had been or were connected. The business man down town was frequently a more influential factor than was the college president. The coach, the trainer, and the managers were the dominant factors and brooked no interference, medical or academic.

Now as we look back over this situation and consider other factors attending the development of intercollegiate sports we can readily understand why there were so many injuries, especially in football. Every emphasis was placed upon improving the strategy and tactics of the game, and little consideration was given to the question of whether or not the changes decided upon were going to increase or decrease the danger of injury to the players so long as the team was made more effective. How many and how serious these injuries were is hard to estimate; but making all allowances for inaccurate reports in the press, and taking into account the fact that no reliable record of athletic injuries was kept anywhere until early in the 1900's, still one can get accounts from old players which together with one's own experiences warrant the conclusion that the list was long and serious.

Skilled medical treatment was rarely available as indicated in a recent letter from Parke Davis, who said: "In my day we coaches (note the "we," because his statement describes a condition that was practically universal in those days) were also team physicians and surgeons. I have dressed many cuts and other wounds and bound all sorts of sprains, and once I set a dislocated shoulder." Mr. Davis' experience is typical of conditions throughout the country. The students made no complaints. As a matter of fact, an air of fortitude and nonchalance was fashionable. This condition of affairs serves to support the conclusion attributed to a discriminating student of human nature who once said, "the Anglo-Saxon takes his games seriously and his injuries lightly as an unavoidable risk."

My own experience in football began in 1888; and during every season from that time on to 1911 I played, coached or served as team doctor. Part of this time I was in New England and the balance in Chicago. I've had my share of injuries—among others a fracture-dislocation of the elbow. I was treated hours later by a surgeon who reduced the dislocation and put me up in a Sayre adhesive dressing. During the following hours, until about four in the morning when I got the tape off by fastening one end to the bed post and unwinding myself, I had time for contemplation, out of which came two conclusions that were useful in later years: (a) I've never used a Sayre dressing in an injury of shoulder or elbow, and (b) I've had a keen appreciation of the suffering a boy endures however stoically when I have had to treat a similar injury. Such other injuries as I suffered in school athletics were treated by one of my friends or by the teacher of history who acted as team manager, after which nature was allowed to take its course.

My own experience and observation confirm Mr. Davis' statements, and warrant the conclusion that with rare exceptions there was no

adequate provision anywhere in the country for prompt medical treatment of injuries received in athletics. In the meantime as intercollegiate athletics spread throughout the country, the toll of injuries grew longer and their severity increased.

This brief sketch of some of the early phases of the intercollegiate athletic problem has been given to serve as a sort of background against which we may view the origin and development of the "team doctor" and the tardy provision of an adequate program of prevention and treatment of athletic injuries.

Among the men graduated from medical schools in the 90's were some who had played on teams during their school and college days. These men retained their enthusiasm for athletics and some of them took the opportunity afforded by their personal and official contacts to serve as team doctors. In these early days, some men like Sanford at Yale, Conant and Nichols at Harvard, White and Miller at Pennsylvania, Church and Wright at Princeton attended to injuries suffered by football men as a special function in addition to their private practice. During the same decade two institutions, McGill University and the University of Chicago, appointed medical men who had been University athletes during their college days, as full time medical directors and members of the faculties, thus following the example set 40 years before by Amherst College. These men were in charge of the clinical care of students and also were responsible for the general supervision and medical treatment of all athletic teams. In other words, they served the combined functions of University physician, supervisor of physical training and team doctor.

Now these young doctors had gained from their athletic experience and medical training a fresh point of view which was brought to bear upon the problems of training and surgical treatment of athletes. Pioneer studies were made on the effects of training, training table dietaries, methods of treating injuries, and types of medical examinations to determine the fitness of candidates and players to take part in sports, which in a few institutions lead to a definite improvement in the protection and treatment of athletes.

Don't be misled by this statement, for I must emphasize the fact that while there was real progress in some institutions during the first decade after 1900, on the other hand in the great majority of colleges and schools conditions showed little change for the better. There was for years, and indeed there still is, far too great a lag between the development of techniques, exactions and higher standards of performance in intercollegiate sports, especially football, and the application of knowledge of the physiological effects of training and contests; desirable types of training for the individual and the squad; the invention of protective apparatus and the provision of competent medical and surgical supervision to supplement and direct the "trainer system." In other words, the technique, strategy and tactics of sports have developed much more rapidly and are generally on a much more scientific basis than is the provision for the selection, training and medical treatment of the individual athlete.

In the early days the scope of the team doctor was sharply limited. His principal and in many cases his only function was to treat the students for such injuries as they might suffer while taking part in a sport. In the meantime the coach and the trainer laid out the training program, supervised the diet of the training table and decided upon the fitness of the individual student to continue in practice or to return to practice after an illness or injury. Under these conditions it is not difficult to understand how the seasonal coach, eager for success, would lose sight of the best interests of the individual athlete. Certainly such a situation was and still is in many cases responsible for much unnecessary damage.

In many cases in those early days, the trainers themselves had been competing athletes in professional contests, and had picked up directly or indirectly their ideas of diet, methods of conditioning, etc., from the English professional trainers. This accounts in part for the persistent vogue of the heavy protein diet, the limitation of milk and other fluids and the dependence upon malt liquors or wines in dealing with cases of "staleness." Their lack of knowledge of surgical cleanliness, together with the characteristics of the training table diet were responsible for the common occurrence among squads in hard training of various skin infections and "crops of boils." It was not uncommon under these circumstances for a man who had been treated for a few days for the sprained joint or bruised muscle to have added to his troubles the appearance of skin infections. Still another factor in this situation was the prevalent use of special rubbing mixtures containing oils or grease, many of them

made up according to secret formulae which were carefully guarded.

At the same time, it must be said that a few of these older trainers were better judges of condition and more efficient in their treatment of minor injuries than was the average doctor of that time, who frequently was dependent upon the limited knowledge of these matters that he obtained during his medical course or upon his experience with older patients in the ordinary hospital service.

One of the earliest reports upon the effects of athletic training was made by Dr. Darling[1] of Harvard in the late 90's when he studied the candidates for both the four mile and the two mile rowing races. He took into account changes in weight, body temperature, pulse rate, heart condition, kidney function, blood and the digestive system. He checked also the changes in these observations brought about by physical activity by examinations made immediately before and after time trials. The information gained from these studies had value as a guide in training, is still reliable, and was worthy of wider adoption than it received. Darling proposed that similar observations and studies might be made to advantage on members of the football squad.

Some years later, Dr. Nichols, who had been appointed team surgeon for the football squad at Harvard in 1904 reported[2] the results of a study of injuries received by members of the football squad previous to a recent change in the rules and contrasted the statistics for the season of 1905 with the list of injuries received by candidates on the squads of 1906, 1907, and 1908. This, I think, is the first scientific analysis of a complete record of injuries incurred by the members of the squad in a single University over a period of years; at least it is the first one of which I can find any record. Here again was a pioneer study of great value which failed to receive the attention and imitation that it deserved.

As time went on the function and responsibility of the team doctor were gradually enlarged to include a program of prevention as well as of treatment. These preventive measures consisted of a preliminary medical examination upon which was based a decision as to the student's physical fitness for the sport of his choice; to advise and in some cases to prescribe the diet and the program of training; to decide if necessary when the athletes should discontinue the activity, or return to practice after an interruption in training due to injury, illness or staleness. For many years, the responsibility for decisions of this type was in practically all institutions assumed by the trainer or the coach—indeed I suspect that this practice is the rule in most places today, while in relatively few instances is this important function performed by the doctor.

Another aspect of a preventive program in which some doctors have been of the greatest value has to do with the devising of special protective strapping, bandaging and padding; and finally in recent years when in many places agreements are in effect which limit the beginning of squad practice to a period of ten days or two weeks before college opens, the value has been recognized of a well thought-out program of exercise and training to be followed by the individual student during the summer vacation. There is very great value in such a program conscientiously followed by the individual, both because it frees the coach from the necessity of postponing team practice until the members of the squad can be given conditioning work after their return to college and because the individual who joins the squad in good condition is much less liable to the ordinary injuries.

The scope and importance of the duties and responsibilities of the Medical Supervisor of Athletic Activities have been outlined in the previous discussion. The question arises, then, as to the qualifications necessary to enable him to achieve success in this new specialty of "team doctor." This term is used both because it appears to be warranted by the nature and extent of this field of service and because in recent years the "sports doctor" has been officially recognized in Germany.

That he should have a sound training in medicine and surgery, including clinical experience, goes without saying. With this training as a foundation, his ability to arrive at sound decisions and to inspire confidence will be greatly increased if he has had personal experience as a competing athlete and as coach of a personal contact sport. These experiences will enable him more easily to understand the psychology of the athlete and the coach and will give him a better understanding of the physiology of the adolescent as well as of body mechanics, particularly of the joints. He should be able to make a reliable estimate of the reactions of boys of widely differing natures and characteristics. I have felt for many years

1. Boston Medical & Surgical Journal, August 31, 1899.
2. Boston Medical & Surgical Journal, January, 1906; also Boston Medical & Surgical Journal, January 14, 1909.

that the doctor's effectiveness and judgment would be greatly enhanced, if, while he was a competitor, he had suffered several injuries. Such an experience will enable him to differentiate more successfully between the injuries that are very painful but of no fundamental importance and those that are attended by minor discomfort, such as concussion of the brain, but are potentially serious.

If the little gods of trouble had deliberately entered into a contest to devise tough situations, the one involving the relationship between the team doctor and the coach would take the first prize. There are few situations in a doctor's experience which make such demands upon his skill, judgment, poise and "backbone." A football season is one emergency after another. As the important games approach questions arise of vital importance to the coach, the team and the boy. The satisfactory solution of such problems makes heavy demands upon the knowledge, co-operation and mutual respect and confidence of the coach and the doctor. For example: The question as to when an injured man should be returned to practice is an important one from the standpoint of both the boy and the coach. In general, an injured player should not be returned to the squad until he can handle himself in such fashion as not to incur further injury. Only in this way will he be of real use to the squad. A decision in such a case is not to be based upon medical grounds alone, but also upon an intimate knowledge of the game, the boy's attitude and aptitude, the coach's spirit of co-operation and the knowledge of protective equipment. When the coach and the doctor co-operate, the best results are assured. In this connection, a device, used first, I think, at Harvard, is very useful. The doctor draws up and presents to the coach before each practice a list of sick or injured candidates, giving the diagnoses, whether or not they can practice or play; and, for those who may not practice, an estimate of the time they will probably lose. The use of such a list accomplishes several things. First, it tells the coach that certain men are not available and so enables him to plan his day's program; second, it affords an opportunity for the coach and the doctor to talk cases over and to get each other's viewpoint, which is the keynote of co-operation; third, it removes all responsibility from the boy.

It is not enough for the doctor to tell the boy what he is to do or the limits he is to place on his activity during a practice period, because the student is often lead to risk further injury by answering the coach's call rather than to admit before the squad that he has an infirmity.

Another situation that calls for confidence and fine team work between the coach and the doctor arises when a man is hurt during a game. The doctor's decision, which must be made *within two minutes,* as to whether or not the boy should be removed from the game, calls for speed in examination, skill in diagnosing the condition and a high degree of discriminating judgment. These and other similar situations indicate the importance of co-operation between the coach and the doctor, and of the doctor's ability to gain the confidence of the player.

The doctor who possesses the qualifications and personality outlined above can make a success in any branch of medicine he may choose. However, I do not know of any field where there is greater need of such men than in school and college athletics. The doctor who selects this line of work will never get rich, but he will have an interesting and useful career. No one else in the institution will have the opportunities that come to him to receive student confidences and to give help in the solution of difficulties.

I think we are justified in feeling that great advances have been made in this important field during the past few years. It is gradually becoming clear to all those who believe in the value of amateur athletic competition that a large proportion of the injuries and disabilities occurring in sports can and should be prevented, and that there is available for immediate use a large amount of information and experience that has been organized into a practical program for the supervision and conduct of college athletics.

It is only just to call attention to the fact that much credit for this progress, especially during the past twelve years, is due to the influence of this Association. It has led the way in collecting reliable information regarding the nature and importance of the function of the team surgeon by calling upon its members at Harvard, Yale, John Hopkins and elsewhere to discuss various phases of the prevention and treatment of athletic injuries. These conferences have been of great practical value, both in establishing in the minds of medical men a better conception of the problem as a whole

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The JOURNAL LANCET

Represents the Medical Profession of
MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA

The Official Journal of the

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M. E. Herz, *Business Manager*
84 South Tenth Street, Minneapolis, Minnesota

W. L. Klein, 1851-1931

MINNEAPOLIS, MINN., MAY 1, 1934

THE 1934 TUBERCULOSIS CAMPAIGN

As this issue of the JOURNAL-LANCET is being distributed over various parts of the country, nearly all of the states it reaches are concluding an educational campaign against tuberculosis. The method of attack in this campaign of 1934 is entirely different from that of 1928. We have eliminated, for the most part, methods which have proved to be of little value or even useless and are now concentrating on more specific measures of detecting tuberculosis. This new information is being broadcast to the people of the entire nation through the National Tuberculosis Association and its component organizations.

In Hennepin County, Minnesota, an ideal program has been under way since last fall and is now being intensified to aid the national campaign The program as outlined is ideal because it is one of co-operation among the County Medical Society, County Tuberculosis Association, and the Minneapolis Health Department. In order to increase the interest of the members of the medical profession in the new methods of detecting tuberculosis, the County Tuberculosis Association provided each physician with a tuberculin syringe and has since delivered to the offices of physicians, tuberculin properly diluted for the intracutaneous test. Since this program was initiated, talks on the subject of detecting tuberculosis among apparently healthy individuals have been presented before many of the hospital staffs; others are still having presentations on the subject.

Already the campaign has resulted in the finding of a number of cases of tuberculosis. For example: One of the physicians limiting his work to nervous and mental diseases had a patient referred to him for a condition in his field. Largely because of the tuberculin-testing campaign, he administered the test to this patient, and when it reacted positively, he had further phases of the examination done, which resulted in the finding of definite tuberculosis with cavity formation in one lung. This disease had previously been unsuspected. Obviously, the placing of such a patient in an institution for nervous and mental cases, or treating him in his home would have been a danger to his associates if the tuberculous disease had not been detected. Now, it is possible to treat him for the nervous disturbance, and have his tuberculosis brought under control in such a way that he is not a menace to the nurses and others who care for him and associate with him. I could cite a considerable number of such cases which have been brought to light by physicians who are doing general practice or are limiting their work to specialties other than chest diseases.

To date, the campaign has been very much worth while, and it will doubtless lead to the finding of many more cases in the offices of physicians. Such work is most economical, since many of the patients whose disease is detected in

this manner and before symptoms appear do not need institutional care. They have not lost their earning capacity and, therefore, do not require tax funds for their treatment. It is also excellent economy when the advanced case of tuberculosis is detected, who does need institutional care, in that the proper isolation of such a patient saves the community large sums of money which would otherwise need to be spent, as the decades pass, for patients who would have contracted their disease through exposure to this case.

The Hennepin County groups are to be congratulated for the co-operation they have manifested. After all, in the control of a communicable disease unanimity of effort is essential. It is this that has made for the great success of the program of the National Tuberculosis Association.

J. A. M.

VACATIONS

Some take them while some do not, but as a class, physicians neglect vacations. Others usually consider an annual holiday of say two weeks a very necessity. Teachers and students get more.

On the universally conceded basis of a fortnight for others, we maintain that a physician is entitled to two months, and here are the figures we would submit to support that contension. There are fifty-two Sundays and a few other legal holidays every year on each of which the physician is actually or impliedly on duty and subject to call. If he were to take his holidays then all at one time, it would make a generous two-months with only scant allowance for *his* fortnight, thought to be so indispensible by others.

Choosing between a vacation and coronary sclerosis should not be a difficult task but the fact remains that after the decision has been made it must be acted upon. The figures here given may serve to establish the doctors' rights in discussions with his patients.

A. E. H.

PERIPHERAL CIRCULATORY FAILURE

The spectacular portion of any irrigation system is the series of pumps, dams, or conduits designed to build up hydrostatic head and lead the water to the distributing ditches. But the business end of the system is the collaterals that evenly ooze the water into the productive soil where radiant energy complementing nature's mother substances inaugurates synthetic processes which promotes growth, maturity and fructifying. The escape of excess moisture, the evaporation, the wind, cloud, rain and snow sequence complete the cycle.

Warfield has recently forcefully drawn attention to comparable circulatory phenomena worthy of the closest scrutiny. Ulrich, a decade ago, outlined the same material after translating from the German Hans Eppinger's monograph on capillary failure. Thus do we witness sluggishness of clinicians averse to acceptance of disturbing viewpoints contrary to cherished traditional practices. It is not that Krog discovered the capillary system or that any thinking doctor did not realize that it was quite as vital to get the blood back to the heart as to dispatch it from the ventricles; rather did the observable cardiac phenomena (rate, rhythm, structure and apparent competency) cloud the issue as to just what was happening in certain dramatic situations, after shock, infection, heamorrhage, or combinations of them all. It has required dramatic events (often arising after surgical operations), such as massive atalectasis, to draw attention to the importance of the diaphragm in sucking blood back into the thorax, permitting auricular filling (the greatest of all stimuli to effective ventricular contraction and output); subdiaphragmatic bile accumulations after gall tract surgery to kink the vena cava inferior and institute futile tachycardia where minute volume output drops precipitately.

The small arterioles furnish the major peripheral resistance against which the heart muscle may effectively contract. If their tonicity is lost, the capillaries offer no resistance and their subtle osmotic interchanges soon topple synchronously with many of the most necessary body constants. This type is best exemplified, for example, in the severe crises after thyroid operation for Grave's disease. We await an effective parasympathetic stimulant; Warfield suggests large doses of strychnine given frequently. Transfusions and large molecule gum arabic solutions are obviously useful to keep up rates of blood flow peripherally. Such matters as blood viscosity remain quite abstruse, but very important. The *gradual* introduction of glucose solution intravenous instead of absurd overloads given in a few minutes —these and many allied physiological approaches challenge present day attention.

E. L. T.

THE CONTROL OF TUBERCULOSIS AMONG ANIMALS

The greatest demonstration of tuberculosis control that the world has ever seen has been that conducted by the veterinarians and closely allied groups in the eradication of tuberculosis from cattle. The national organization known as the

United States Live Stock Sanitary Association has been fighting tuberculosis and other diseases in animals for years, not only with the idea of solving a great economic problem, but also of helping to solve a great public health problem. The Proceedings of the Thirty-Seventh Annual Meeting of this Association has just been issued, and no physician can afford not to read this volume. Many of us have not been cognizant of the fact that the veterinarians of this country have played an unusually large role in protecting the human family against certain very disabling and destructive diseases.

The address of the president, Dr. E. T. Faulder, of Albany, New York, calls attention to the splendid work which has been done to control many diseases, such as anthrax, rabies, Bang's disease, and tuberculosis.

The opening address of this volume is by Dr. Morris Fishbein. This address in Dr. Fishbein's inimitable manner is most interesting, stimulative, and instructive. Among other facts, he points out that there are now more than one thousand magazines, bulletins, pamphlets, and reports regularly indexed in the new Index Veterinarius.

In these days when physicians are being questioned about the tuberculin test, not one can afford to fail to read the classic by Dr. Marion Dorset, Chief, Biochemic Division, Bureau of Animal Industry, United States Department of Agriculture, entitled, "A Comparison of Koch's Old Tuberculin with a New Synthetic-Medium Tuberculin." Dr. Dorset's new tuberculin has definite advantage over the old; in fact, it is the untiring work of Dr. Dorset that has given the veterinarians and the physicians of this country their chief weapon against tuberculosis, namely tuberculin. It is also of considerable significance to know that from Dr. Dorset's tuberculin Pure Protein Derivative, now being used by the National Tuberculosis Association, is prepared.

The paper entitled, "Progress and Status of Cooperative Tuberculosis Eradication Work," by Dr. A. E. Wight, Chief, Tuberculosis Eradication Dvision, Bureau of Animal Industry, calls attention not only to past accomplishments but also to the magnitude of the tuberculosis eradication problem. He points out that there are already thirteen states accredited and four more which will probably acquire this status within the next six months. He also calls attention to numerous ordinances that have been enacted requiring that all herds of cattle used in supplying milk to municipalities be tuberculin-tested. In several cities the ordinances require that butter and other dairy products be obtained from tuberculin-tested herds.

Dr. Charles E. Cotton, of St. Paul, as chairman of the Committee on Tuberculosis of the United States Live Stock Sanitary Association, with other members of the Committee, presents an excellent report which shows the plan for accrediting cattle herds.

In our campaigns against tuberculosis in the human family, we must join hands with the veterinarians and other allied groups more closely than in the past. They have gone much further in eradicating the disease from the animals than we have in the human family. There are many lessons we can learn from them; in fact, we should adopt their program of tuberculin testing everywhere. While they are able to slaughter the positive reactors, we have an equally good substitute in isolation of those who require it, treatment of those who can be successfully treated, and education of all.

J. A. M.

DR. EARL R. HARE

As I look back over forty classes graduated from the University of Minnesota Medical School, I am struck with the thought: How many of these graduates have become outstanding; how many have lived up to the ethics of our profession, and who are they that are carrying the torch onward and ever onward, with the hope of reaching the ideal; ever being dominated with a noble objective—to extend and to advance medical knowledge and to maintain a high standard of medical education. Having been closely associated with Doctor Hare both as a student and as one of my assistants for ten years, I can truly say that he was one of the few who measured up to the above requirements; always an earnest student, dependable, courteous and tolerant, and expressing a zeal for the cause. As a teacher he sought to interest the student in his work, which gained for him the respect of the student. And thus it was with his practice; he was earnest with his patient, never seeking advantage, was always giving more then he received. His patients loved and respected him. Several scientific societies of which he was a member denotes the zeal and interest he had in his profession. In civic and commercial associations he was universally respected and well known for his keen sense of justice and forbearance. In his passing, we who knew him intimately and loved him, feel a keen sense of loss; yet it is not a loss in another sense, because his influence will last. His

fellow practitioners and those associated with him in scientific associations will also experience his loss, and yet his presence will be felt in years to come. As in his life he reached the true values, so in his death he was victorious; for whosoever will live contentedly and die happily must not pursue public applause, but must give more than is given him and love without asking a return. This is what Doctor Hare practised.

CHARLES A. ERDMAN

THE HISTORY AND FUNCTION OF THE ATHLETIC TEAM DOCTOR

(*Continued from Page 275*)

and in improving the administration of the services now in operation.

It remains now to present the whole subject to educational authorities, especially those heads of institutions in which competitive athletics are a feature. This presentation must emphasize clearly and continuously several important facts:

1. That a large proportion of the injuries that occur in athletic training and competition are preventable.

2. Conversely, that the number of injuries due to accident as such is relatively small.

3. That experience and investigation have made possible the organization of a practical, protective program for the medical supervision of physical activities.

4. And finally, that the heads of educational institutions are in the last analysis responsible for the introduction and support of a program of supervision that will enable their students to enjoy the benefits of competitive activities of all grades with a minimum of risk and harm to themselves.

NEWS ITEMS

Dr. G. S. Seiffert, formerly of Mohall, is now associated with the Northwestern Clinic at Minot, N. D.

Dr. W. O. McLane, formerly located at Sleepy Eye, has moved to Jackson, Minn., where he will open a new hospital.

Mrs. (Dr.) E. C. Stucke, Garrison, N. D., is on a three-months vacation in Europe. Most of her time will be spent in Russia.

Dr. W. L. Forster, recently of Wills Eye Hospital, Philadelphia, has become associated with Dr. A. D. McCannel, Minot, N. D.

Dr. C. E. Robbins, Pierre, S. D., is taking a few weeks post-graduate work in eye, ear, nose and throat surgery at Indianapolis, Ind.

Dr. Goodwin Ohmanson, formerly located at Nicollet, has decided to move to Hanska, Minn., where he will continue general practice.

Dr. S. A. Cooney, Helena, has been appointed to another seven-year term as a member of the Montana state board of medical examiners.

The Northern Minnesota Medical Association will hold their annual meeting this year at Brainerd. Dr. O. O. Larson, Detroit Lakes, is secretary.

The Sioux Falls Medical Society were honored last month by an address given by Dr. Harold Swanberg, Quincy, Ill., editor of Radiological Review.

Dr. John H. Rishmiller, Minneapolis, has been spending the winter months at Clearwater, Florida. The doctor plans on returning home about May 10th.

The Stearns-Benton Medical Society held their March meeting at St. Cloud, Minn., with Drs. George Rice, M. Mass and P. E. Stangi, as principal speakers.

Dr. A. J. Ames, of the medical staff of the United States Veterans Hospital, Fargo, was recently stricken with a paralytic stroke, and passed away at a Minneapolis hospital.

The Loretto Hospital, New Ulm, Minn., will celebrate its golden jubilee at a date to be decided during the coming summer, as it is now fifty years since the hospital was opened.

Dr. John W. Gunn, one of the pioneer physicians of Butte, Mont., died at his winter home in California last month. Dr. Gunn had been in active practice in Montana for over forty years.

Dr. Lucius F. Foote, a retired Minneapolis physician, died last month after an illness of only two weeks. Dr. Foote was 82 years of age and a graduate of Northwestern Medical College in 1876.

Dr. Henry Schmitz, Chicago, will be the guest speaker at the meeting May 7 of the Hennepin County Medical Society. His paper will cover "Early Diagnosis and Treatment of Uterine Carcinoma."

Dr. W. A. Fansler, Minneapolis, was the guest

speaker at a meeting of the Cerro Gordo County Medical Society, at Mason City, Iowa, on April 17. Dr. Fansler presented a paper on "Carcinoma of the Rectum."

The April meeting of the Todd County Minnesota Medical Society brought out a large attendance, who listened to an interesting paper on "Treatment of Skin Diseases" by Dr. Hanson of the University of Minnesota.

The Minnesota Hospital Association will hold their annual meeting at Rochester on May 24 and 25. A very interesting program has been arranged for each session. J. G. Nordby, Minneapolis, is president of the association.

Dr. Frank J. Savage, St. Paul, president of the Minnesota State Medical Association, and Dr. Martin Norland, Minneapolis, were the guest speakers at the April meeting of the Washington County Medical Society, held at Stillwater, Minn.

Dr. Harold T. Nesbit, who has been associated with the Southwest Clinic at Dallas, Texas, has recently opened offices in that city for the special practice of diseases of infants and children. Dr. Nesbit is well known by a large list of Minneapolis friends.

The annual meeting of the Southern Minnesota Medical Society will be held during the month of August at Mankato. The program will include the discussion of symptoms, rather than diseases, and a medal will be awarded to the best case report. Dr. M. C. Piper, Rochester, president; Dr. H. C. Habein, Rochester, secretary.

The Minnesota State Medical Association broadcasts weekly at 10:30 o'clock every Wednesday morning, over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M. D., associate professor of pathology and preventive medicine, Medical School, University of Minnesota. The program for the month of May will be as follows: May 2, Coronary Disease; May 9, Crippled Children and Their Problems; May 16, Chickenpox; May 23, Twilight of Hearing; May 30, Blood Vessel Tumors.

The Renville County Medical Society, which was recently organized at Olivia, Minn., have sponsored some very interesting meetings, with the following papers being presented: April 10, Dr. E. C. Robitshek, "Colles Fracture;" April 17, Dr. E. A. Loomis, "Refraction, with General Practitioner's Equipment:" April 24, Dr. E. T. Herrmann, "Anaphylaxis;" May 1, Dr. F. H. K. Schaaf, "Bedside Diagnosis;" May 8, Dr. H. B. Hannah, "Neuritis;" May 15, Dr. W. H. Condit, "Gynecology, Office Practice;" May 22, Dr. T. W. Weum, "Technique of Labor;" May 29, Dr. F. C. Rodda, "Abnormal Child, Examination and Diagnosis." Officers of the society are Dr. W. A. Brand, Redwood Falls, president; Dr. R. S. Madland, Fairfax, vice president; Dr. John Dordal, Sacred Heart, secretary.

Dr. A. W. Eckstein, forty-six years of age, and licensed to practice medicine in Minnesota, was sentenced to two years at hard labor in the State Penitentiary at Stillwater, by the judge of the district court at Mankato. Dr. Eckstein entered a plea of guilty to a charge of criminal abortion on a nineteen year old farm girl. Dr. Eckstein appeared before the Minnesota State Board of Medical Examiners in 1932, on a similar charge, at which time he was censured and warned as to the consequences in the event that he had any similar trouble in the future. Apparently the warning was in vain, for the records indicate that he performed a number of abortions subsequent to his appearance before the board. In addition to his two year sentence at Stillwater, which he is now serving, he will have to show cause before the State Board of Medical Examiners why his license to practice medicine should not be revoked.

It has come to the attention of the Minnesota State Board of Medical Examiners that Mrs. Bessie Magnussen, Duluth, who is listed in the Duluth city directory as the pastor of the First Spiritualist Church, has been giving massage treatments in connection with her spiritual healing. Mrs. Magnussen holds no license to practice medicine nor massage in the State of Minnesota; neither is she registered under the Basic Science Law. Practitioners of mental or spiritual healing are exempt from the Basic Science Law only so long as their administrations or attempts to treat are confined *exclusively* to mental or spiritual means. They are not permitted to practice healing in any other manner. This matter has come to the attention of the Medical Board following the death of a woman who was afflicted with cancer, and who had been a patient of Mrs. Magnussen for some time prior to her death. She had been warned by the Board to confine her practice exclusively to mental or spiritual means. The Medical Board requests that any information indicating the contrary be promptly submitted to the board at 524 Lowry Medical Arts Building, St. Paul, in order that the necessary action may be taken. The board invites the co-operation of everyone concerned in this or similar cases.

The JOURNAL LANCET

Minneapolis, Minnesota
May 15, 1934

New Series
Vol. LIV, No. 10

On Paraplegia in Pott's Disease*

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Introduction

WHEN internal fixation or bone graft methods were introduced in the treatment of spinal tuberculosis, investigation was, as you know, reopened over the whole field, particularly in its pathological and prognostic aspects; this was and is necessary to give a solid background to the pros and cons of the argument. Now it seems to me that a similar situation, in a smaller measure, obtains in the question of Pott's paraplegia, although on this point there is more general accord, and the comparatively newer viewpoints, when introduced, were not likely to produce a radical change in the general attitude toward this disease; but they did produce some modification and they caused the general reaction toward paraplegia to become less fixed upon the conservative treatment alone than it had before.

It is for this reason that I selected this topic.

Paraplegia represents, no doubt, the most serious complication that can arise in spinal tuberculosis, yet, compared with deformity or abscess formation, its incidence is much less.

I. Statistics

There is a distressing discrepancy in the statistical figures. When one compares Bouvier's figure of 50 per cent paraplegia for the cervical and dorsal regions with that of Dollinger who among seven hundred cases found only 7.9 per cent of compression paraplegia, it becomes obvious that the definition of Pott's paraplegia must be very loose to allow of such wide divergencies. Seemann, in 1913 (Treatment of Joint Tuberculosis and their Results, Spondylitis Tuberculosa), counting in all sensory and motor signs of all degrees, gives 46 per cent of which only 10 per cent could be classified as severe.

Our own series of spinal tuberculosis embraces 527 cases, and among these in less than 20 per cent there was paraplegia, if one excludes all those cases which show no more than increased patellar reflexes, i. e., cases with ankle clonus, more or less rigidity, etc. Of this number, however, only twenty-six, or five per cent, could be classified as severe. Similarly, Valtancoli[1] finds only in 3.9 per cent complete paraplegia.

Statistics further show that the paraplegias are more or less uniformly distributed over the various decades, having their minimum of 2.7 per cent in the fourth and their maximum of 5.8 per cent in the fifth decade.

Much more significant is the location of the tuberculous focus. There is a high percentage of paraplegia in the cervical spine (Seemann, 50 per cent), a lesser in the dorsal spine (26 per cent), and, finally, in the lumbar spine 23 per cent, the latter being, therefore, the least inclined to produce compression paraplegia. Comparing paralysis with total incidence of spinal

*Paper read before the Hennepin County Medical Society, Minneapolis, March 5, 1934.

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1. Chirurgia organi di movimento, Vol. 5, 1921.

tuberculosis, Valtancoli[2] finds the dorsal spine engaged with 76.8 per cent, the cervicodorsal with 12.8 per cent and the darso-lumbar with 2.5 per cent of all cases, the difference in these percentage figures being, of course, explained by the comparatively overwhelming frequency of the dorsal localization as against the cervical, an observation which is on the whole corroborated in our own series.

II. Pathology

There is still a great deal of controversy about the anatomical factors which are responsible for the compression.

It is generally agreed that the compression is not caused directly by bone but is the result of inflammatory products which reach the spinal canal. The extension comes either directly through the vertebral body or reaches the canal through a mediastinal or prevertebral abscess which perforates the body of the vertebra and reaches the extra-dural space. Next to the penetrating abscesses, pressure is exerted by inflammatory granulations crowding against the anterior aspects of the spinal cord. Only exceptionally actual bony pressure exists. Where the compression is bony, as is sometimes the case in suddenly collapsing spines, there is no relief from decompression procedures. On the other hand, granulation tissue of abscesses reaching the spine through the vertebral body or by continuation of the prevertebral abscess, eroding and perforating the body, produce an elastic pressure which may yield to decompression measures.

In 1871 Michaud, a pupil of Charcot, called attention to posterior compression of the spinal cord by an external caseous pachymeningitis. This type of compression offers much greater possibilities for operative relief. Here, again, one must distinguish between bone pressure and elastic pressure from abscess, or tuberculos granulations. But is should be remembered that tuberculous granulations will become rigid and unyielding as they become organized, as demonstrated in several cases in our series. Recently, it has been pointed out by Girdlestone that compression of the posterior aspect of the cord may also occur by counter coup when the spine is forced backward by the anterior granulation tissue and the cord thereby becomes impinged against the lamina, and in this case also relief may be expected from laminectomy.

Schmorl,[3] investigating the cord changes many years ago, found that compression of the meninges produces blocking of the lymphatic flow and indirectly edema of the arachnoids and leptomeningitis with functional disturbances. If the adema exists for a long time it comes to softening processes and reactive inflammation and, finally, ends up in sclerosis of the cord. Only rarely true tuberculous masses are found in the cord, but it is not uncommon to see specific inflammatory changes which extend from the bony focus into the substance of the medulla.

There is no doubt that the mechanical nature of compression by soft elastic tissue is such as to offer a much greater chance for regeneration of the spinal cord than exists in other situations which produce compression paralysis. It is upon these grounds that the general opinion sponsors, above all, the conservative recumbent treatment as the method of choice in the management of Pott's paraplegia.

III. Symptoms

a. Motor:

The typical compression symptoms are of the spastic paralytic type, These are muscle rigidity, increased tendon reflexes and spastic paralysis of the extremities. Disturbances of the function of the bowel and bladder, as well as trophic disturbances, are often associated with a higher degree of spinal compression. The patient begins to complain of becoming tired, the limbs feel heavy and insecure in walking, and develop a certain rigidity. He will avoid movements such as running and jumping, he stumbles and falls easily and, when walking, he often complains of having difficulty in setting one limb in front of the other.

In tuberculosis of the lower cervical vertebrae there is occasionally seen paralysis of the upper extremities, as well as of the lower, and of the musculature of thorax and abdomen. Contractures set in at a much later stage, when the patient is already bedfast. It is then that flexion, abduction and inward rotation contractures of the hip and flexion contractures of the knee and ankle appear. In extreme cases the flexion contracture may be so extreme that the thighs are touching the anterior abdominal wall. There is often a marked reflex irritability which causes the limb to contract spasmodically at the slightest touch or pressure. In the later stages, as the degeneration of the spinal cord proceeds, the symptoms change from the spastic to the flaccid type. It is frequently found in adult patients that such a change from the spastic to the flaccid paralysis comes on with unusual rapidity, often in the course of one or two days, so that energetic operative procedure for the relief of pressure becomes necessary.

2. Chirurgia organi di movimento, Vol. 5.
3. Compression Myelitis in Caries of the Spine, Wiebaden, 1890.

b. Sensory:

The early sensory symptoms may be pain of local or lancinating character due to pull or pressure upon the roots of the spinal nerves. The patient complains of radiating pain in the chest, the abdomen, the groin, or the lower limbs. In cervical spondylitis radicular symptoms appear earlier and with greater frequency as forerunners of compression myelitis. Here, radiation is distributed along the brachial plexus and sometimes combined with irritative symptoms of the sympathetic system.

The objective sensory symptoms appear more frequently after the beginning of the motor disturbances. There is retardation of perception, hypaesthesia, and finally complete aenesthesia. They begin usually at the periphery of the limbs and run out towards the roots. According to Michaud, tactile sensibility disappears first, whereas Charcot maintains that the temperature and pain sensibility is the first to disappear, while the tactile sense remains. In general, these objective modifications of sensibility are accompanied by subjective complaints, particularly pain in the identical territories. The topography of sensory disturbances is radicular, even in cases where the lesion is entirely medullary and the nerve roots are not involved in decompression.

In these cases it becomes of prime importance to establish the level of the spinal compression which is done by examination of the spinal fluid. The so-called syndrome of Froin consists of massive coagulation of the cerebro-spinal fluid, hyperalbuminosis with relatively few leucocytes. The syndrome of Sicard is that of hyperalbuminosis and a slight degree of xanthochromia. The upper limit of the compression can be determined by the condition of the sensory innervation, and the lower by the study of the deep sense reflexes, although it is always difficult to determine with accuracy the upper limit of the sensory paralysis.

IV. Treatment

a. Conservative:

We have already stated that because of the mechanical nature of the compression by soft and elastic tissue, the general opinion has always favored the conservative recumbency treatment as the method of choice. This is undoubtedly correct for the vast majority though not for all juvenile cases, and also for a greater number of the cases of paralyses which develop later in adult life. In adults the prognosis of paraplegia becomes much more severe and it does not always yield so readily to treatment. The combined statistics of Köhler, Lovett, Mohr, Reiner, Dollinger and Vulpius, embracing 110 cases of paralysis treated conservatively, show 52.7 per cent cured, including the severest forms of paralysis in children, as well as in adults. Of seventy-four cases reported by Gibney, 77 per cent were cured or improved. Furthermore, while the severest forms of unrelieved paralysis almost invariably lead to death, also, many of the milder cases may persist indefinitely, the patient showing exaggerated reflexes, a certain weakness of locomotion, ataxic gait and easy fatigue.

In Valtancoli's statistics of conservative treatment there were healed 56.8 per cent, and dead 43.2 per cent, the greatest number of deaths being in the fifth decade (66.6 per cent), while in the first decade there were 100 per cent cures. Likewise, the greatest percentage of deaths were in tuberculosis of the dorsal spine, which again explains the prevalence in this localization.. Mouchet, who is also an adherent of the conservative treatment, emphasizes that the true treatment of paraplegia is the orthopedic treatment which, indeed, leads to the desired end result in the vast majority of cases.

Since it is commonly accepted that the conservative treatment of recumbency, reclination or traction, is the treatment of choice for the common run of compression paraplegia, there is no need for further elaborating on that point.

b. Operative:

Nevertheless, the question still remains, what is to be done with those cases which do not yield to conservative means?

There are a number of surgeons who consider that conservative treatment exhausts all possibilities for improvement or cure. Madame Sorrel, who is an ardent advocate of the conservative treatment, claims its universal application for all early cases, expecting that in the overwhelming majority the paralysis will sooner or later disappear, while the late cases, in her experience, do not get well whether anything is done or not.

To this policy exception may be taken on two accounts: In the first place, not all early cases recover or improve under recumbency, as is shown in some cases of our series; furthermore, not all late cases which do not yield to recumbency must be considered as hopeless. It seems to me that this question must be decided first upon the character and the rate of development of the paralysis and, secondly, upon the anatomic features which cause the compression. It was stated that spinal compression usually occurs gradually and insiduously, in keeping with the chronic course of the vertebral disease. There are, how-

ever, numerous cases, young or old, where the appearance of the compression is short and it occasionally happens that the carious vertebra suddenly collapses after slight trauma, which causes the posterior wall of the body to project sharply against the spinal canal. Invariably such cases will show a rapid change from the spastic to the flaccid type of paralysis, sometimes within a few hours.

From the operative side, the compressions of the posterior aspect of the spinal cord are of special interest.

In general terms, operation for relief of compression paraplegia would be indicated if an abscess in the mediastinal space is responsible for the compression symptoms, the operation servicing principally as a means of drainage; or, if the compressing agency is active upon the posterior aspect of the spine so that a true decompression relief may be obtained from the operation. It is our invariable rule to make the indication for operation after long and patient attempts to relieve compression symptoms by conservative means. Occasionally, however, one must act quickly, for instance, where the spastic character of the paralysis suddenly changes to the flaccid type. In our own series of twenty-six cases of severe paralysis which did not yield to recumbency, constituting about five per cent of all tuberculosis of the spine, decompressing operations were performed in nineteen cases. The two operations which come into consideration are the laminectomy and the costo-transversectomy, or combinations of the two. Laminectomies were performed in fifteen and costo-transversectomies in four cases, the ages varying from four to twenty-six for the laminectomies and from five to forty-five for the costo-transversectomies. The duration of the paralysis in the first group varied from a few days up to two years; and in the second group it varied from six weeks to four months.

The first laminectomies for Pott's paraplegia are credited to Israel and MacEwen. It is interesting to note that Mouchet considered it as irrational and ineffective, pointing out that the pachymeningitic focus of the axis is in front of the spinal cord. Some of the slides will convince you, however, that compression of the posterior aspect is by no means unusual. The technique of the laminectomy is exposure by subperiosteal resection until the bases of the transverse processes are laid bare, then all bone is removed by rongeur as far laterally as the articular process, close attention being paid to the first appearance of the dura and great care being taken not to injure it. The cavity is packed with hot sponges in order to control completely the lesions from the bone. When decompression alone is contemplated, and this is most frequently the case in Pott's disease, there is no need of opening the dura.

The second operation, the costo-transversectomy, was first introduced by Menard. He showed that after this operation the paralysis usually recedes as soon as the tension is relieved by the evacuation of the abscess. He, himself, carried out the operation twenty-four times with five deaths and nineteen cures. Two of them had recurrences. Bastianelli reported forty-one cases with thirty-two complete results. The rationale of this operation is given by the fact (emphasized by Menard) that the abscess finds the way blocked for migration and is imprisoned between the pleura and the costal wall, having a tendency to extend into the spinal canal and thereby to compress the cord. Drainage is thereby established by direct route, the technique being as follows: The operation consists in the resection of the lateral ends of the transverse processes with the attached ends of the ribs. The approach is made by stripping the lamina and the neural arches, which is done in the method of Hibbs. Then, one resects the lateral half of the transverse processes followed by resection of the head and neck of the ribs. The operation requires a great deal of care as the lungs and pleura might be easily injured.

The operated cases may be grouped as follows:

I. The effect of laminectomy on paralysis not yielding to recumbency.

1. A man of nineteen: Tuberculosis of the fourth to the ninth dorsal with large mediastinal abscess, duration nine months. Severe paraplegia for seven months, gradually developing weakness, paraesthesia, exaggerated knee jerk, Achilles clonus and Babinski. Laminectomy from the fourth to the eighth dorsal showed angulation and external pachymeningitis with posterior granulations. This case made a remarkable recovery following laminectomy with almost complete motor and sensory return.

2. A young girl, seventeen: Suffering for two years from tuberculosis of the eleventh and twelfth dorsal, developed gradually for the last six months a paraplegia with ankle clonus, complete paralysis and hypaesthesia below the umbilicus. No result of recumbent treatment for one year. Laminectomy from the ninth to the twelfth dorsal showed cord sharply kinked in posterior aspect covered by thin layer of organized granulation tissue. Pulsation returned after resection

of the twelfth dorsal lamina. Ultimately, completely relieved of paraglegia.

II. Recumbency with or without spinal fusion is no security against development of spinal compression.

a. Paraplegia develops during recumbency.

1. Woman, forty-six, with tuberculosis of the ninth to twelfth dorsal of eight years duration, with large prevertebral abscess, showed compression symptoms of severe type, pain, numbness, swelling and spasticity for the last year. During recumbency spasticity improved so that patient soon became ambulatory. Seven years later, patient came back with complete flaccid paralysis, incontinence of bowels and bladder, severe sensory disturbances, the paralysis having come on suddenly. Laminectomy was performed, showing the cord pressed against the lamina with sharp anterior kink below, due to anterior calcified abscess. From this granulation material a very strong band constricted the cord. There was no pulsation below constriction. In this case, cord degeneration had attained such a degree that this operation was of no avail and there was no return of mobility or sensation, or control of bowel and bladder.

2. Man of forty-seven, duration of Pott's disease apparently only four weeks, following tuberculosis of the ninth and tenth dorsal, developed during observation and while in recumbency severe sensory and motor disturbance with rapid pace. Improved considerably during recumbency and traction. Then, suddenly, he had a relapse, lost control of bowel and bladder, and there was immediately laminectomy. The cord was covered dorsally by tuberculous granulation tissue. No pulsation, even after removal of granulations, for a distance of three to four inches. There was no return of function and patient died eleven weeks after operation.

3. Man of twenty, suffering for six months from tuberculosis of the eleventh dorsal with large prevertebral abscess, rapidly developed a severe paraplegia seven days before admission. Immediate laminectomy was done, showing the dura covered with grayish-pink granulations, partly well organized and consisting of dense connective tissue. There was no pulsation. This patient also had no return of either sensory or motor function.

b. Paraplegia develops during recumbency and after spinal fusion.

1. Woman of twenty-nine, suffering from Pott's disease of twelfth dorsal and first lumbar for fourteen years. Had spinal fusion by Hibbs method. Six weeks after the fusion, while in bed, rapidly progressing complete spastic paralysis developed with disturbance of bowels and bladder. Laminectomy was performed. At operation bluish-gray granulation tissue was found surrounding the spinal cord with unfused spicules of bone pressing upon the cord. Dura was flattened and adherent and a small abscess was encountered. This patient regained motion and complete control of bowels in eight months. When seen again, after four years, she walked with only slight spasticity and slight clonus, having made all in all a very remarkable recovery.

c. Paraplegia recurs late after Hibbs fusion.

1. A woman, twenty-two years of age, in 1925 had tuberculosis of the twelfth dorsal and first lumbar vertebrae for two years. There was slight spasticity, patellar and ankle clonus, and Babinski. Paraplegia receded under conservative treatment. In the following year, 1926, a spinal fusion from the eleventh dorsal to the third lumbar was done. Three years later, while under observation in the hospital, a recurrence of the paraplegia of the severest type occurred, with patellar clonus, exaggerated knee jerk and sensory disturbances. This necessitated a laminectomy from the ninth dorsal to the second lumbar. The dura was found covered by blue granulation tissue interspersed with dense white connective tissue. Cord pulsation above but not at the point of constriction or below. Pulsation reappeared to full extent after resection of the posterior constricting band. Patient made an excellent recovery and when again seen, four years later, had no sensory disturbances, no Babinski, walked well in brace, and was gaining weight.

d. Paralysis recurs late, after having yielded to recumbency.

1. Boy of four, seen in 1923, for tuberculosis of the ninth and tenth dorsal, duration one month. Two years later, in 1925, had Hibbs fusion. One year later, in 1926, while still under treatment, developed spastic paraplegia with increase of deformity, inability to walk, limitation of motion, increased reflexes, Babinski, and incontinence of bowels and bladder, all appearing within a few weeks. Patient was subjected to prolonged recumbency and traction and, at first, showed considerable improvement; later on, however, he had a remission which necessitated laminectomy from the fifth to the tenth dorsal. On this occasion there was seen on top of the cord a mass of grayish-blue and red granulation tissue, adherent, with marked angulation of the cord. No pulsation before or after. In this case there was no improvement noted during the observation of almost two years.

III. Paraplegia and Retromediastinal Abscess.

Paraplegia not yielding to laminectomy is relieved by costo-transversectomy.

Here the pressure is due to communication of the spinal canal with a retromediastinal abscess, and these are the cases in which costo-transversectomy alone or in conjunction with laminectomy was recommended.

1. A man of twenty-six who had suffered from tuberculosis of the sixth and seventh dorsal for two years, had developed severe paraplegia four months before admission; he was unable to walk. Because of the severity of paraplegia, laminectomy was done from the fourth to the ninth dorsal laminae. There was no pulsation; the bluish-white dura showed a sharp kink; there was no return of pulsation after removal of the laminae. Following the operation there was first slight improvement, then progress stopped. Two months after the laminectomy a costo-transversectomy was followed by a marked improvement of the spasticity, so that six months later there was no sign of either sensory or motor paralysis. This patient had a recurrence two years later, but this time recovery was obtained by recumbency alone.

Statistics

There were fifteen cases of laminectomy for Pott's paraplegia with end results obtainable in twelve: Relieved by laminectomy seven; not relieved, five.

Costo-transversectomy was performed in four cases: Relieved two; not relieved, two.

There still remains a number of cases of severe paraplegia in which recumbent treatment had failed, in which operation was indicated, but where it could not be performed for one reason or other. We noted that in none of these cases, seven in all, was there any spontaneous return of either the motor or sensory function. Two of them died from septic complications, decubitus and urinary infection shortly after being sent home. This experience seems to indicate that in the group of severe Pott's paraplegia the indication for operation was not made too radically and that, if there was any error in the indication, it was probably on the conservative side. Some cases, undoubtedly, should have been operated upon more promptly.

Conclusions

1. Juvenile cases give a much better outlook under conservative treatment than adults.

2. In our series severe paraplegia not amenable to conservative treatment was observed in early as well as in late cases, that is in cases with short, as well as long, intervals between the onset of the disease and the paraplegia, although it was much more the late cases which did not yield to recumbency than the early ones.

3. There are cases of Pott's paraplegia which will occur in spite of and during recumbency and in spite of previous spinal fusion.

4. Recurrences of paraplegia occur after conservative treatment and even after fusion, and are invariably worse in character and outlook than in the previous attacks.

5. Compression is by no means always active upon the anterior side of the cord; compression by posterior bands of granulation tissue or by counter coup pressure of the lamina against the backward forced cord is not infrequent.

6. Although recumbency with traction is the dominant method, its failure indicates operative relief. Failure, however, must not be judged by the time element alone, but also by the character of the paralysis. Particularly significant is the rapid development of the paraplegia, the appearance of sensory and bladder and bowel symptoms, and especially a tendency to changes from spasticity to flaccidity.

7. When the indication of such operative interference arises, it is essential that one acts promptly, before the spinal cord has succumbed to irreparable degenerative changes.

Present Status of Irradiation Therapy in Cancer of the Breast*

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RADIOLOGY is rather a new field in medicine. Novelty attracts attention, so we find an almost mystical and supernatural regard for this science among the general public who have placed a blind confidence and trust in irradiation therapy. This is based on the hope that this form of treatment will make an operation unnecessary, or give them relief when no other means will alleviate their suffering. The radiologists well realize this confidence and it has been to them a constant incentive to greater endeavors and to attain better results. But conservatism and great caution is imperative in dealing with an agent of such great power. This power is destructive as well as growth disturbing and, therefore, may be a means of great harm in unskilled hands.

As a non-surgical method in the treatment of cancer it has no doubt proven a great help in the cancer control campaign, to bring early cases to seek medical advice. We know that the fear of surgical treatment has been the cause of fatal delay in many a case.

Radium, roentgen rays and surgery are our greatest weapons against cancer at the present time. From the first day that roentgen rays were used to treat a patient, and throughout the short span of its history roentgen therapy has been particularly directed towards ameliorating those ailments in which our medical and surgical skill has failed. This has placed a severe test upon this form of therapy, but has also hastened its general acceptance to an acknowledged place as a standard form of treatment in medical science.

Cancer of the breast—being superficial, was one of the first malignant conditions to which roentgen rays were applied for therapeutic purpose. The first treatment was given in Germany in 1897. The first report in literature was made in 1901 and described two patients who were considered cured after receiving thirty-two treatments. Since then improvement in equipment and methods have made a remarkable progress towards better results. The recently invented dosimeter is of great help in simplifying the administration of a proper dose. It is now possible to exactly copy or repeat any dose recommended. This is very important as the different types of neoplasms respond more favorably to different doses of irradiation. To administer a proper treatment requires competent knowledge of the agent employed, a proper understanding of its function, and its resultant effect on the normal and pathologic tissues. The dose must, therefore, be considered both as to quantity and quality. (I shall not take the time to explain the many principles involved in the proper administration of an irradiation dose, but pass on to the biological problems that concerns this form of therapy.)

It has been shown *in vitro* that each type of tumor tissue can be completely destroyed by a specific dose of roentgen rays, and if less is given there is proportionately less destruction. Some growths respond to comparatively small doses, while others require enormous doses which could not be administered to a human subject. With the co-operation of pathologists, radiologists are becoming familiar not only with the evidences of tissue reaction, but also with the types of neoplasms which are sensitive to irradiation.

However, we are still ignorant of the influences of the environment in which a neoplasm originates and grows. It is because of the differences in enviroment or physiologic response of the host that certain type of tumor may be highly malignant in one individual and comparatively benign in another. As an example, it is a well known fact that most malignant diseases are rapidly fatal in young persons, while an older person with the same type of disease may survive. A similar condition is found in a pregnant uterus, or a lactating breast. The very active physiologic processes in these conditions stimulate the growth of the tumor. Every radiologist has encountered this problem of an effective dose in one case not producing the same results in a similar case. We know then that it is the environment of the tumor in the host that is responsible for its rate and character of growth. But how to influence this environment is still an unsolved problem. It is, therefore, easy to understand that with our present therapeutic methods it is impossible to get favorable results in all malignant diseases.

Direct stimulation of the growth of the tumor

*Presented before the Cass County Medical Society, Fargo, February 26, 1934.

cells by irradiation does not occur. All irradiation doses are destructive. There is no direct stimulating effect. It is, therefore, important to bear in mind that a too intensive dose may affect the natural physiologic resistance of the tissue within the host, as to break down the barrier of tumor growth restraint. This is very likely what happens in some of the tumor cases which develop an early metastasis following their treatments. Our efforts should, therefore, be directed not only to destroying the malignant tissue, but also to protect the patients and aid them in building up their resistive powers.

The effect of irradiation on the tissue is, directly by degeneration of the malignant cells, and indirectly by the reaction of normal tissue to the irradiation. The changes produced in mammary cancer are mainly due to vascular effects. They are a moderate hydropic swelling of the tumor cells, moderate atrophic degeneration, marked collagen swelling, productive arteritis with thrombosis and calcific deposits in vessel walls and productive fibrosis.

It is now quite generally accepted that every case suspected of mammary malignancy should receive irradiation therapy, and surgical treatment when such is indicated. The question is often asked: Is pre-operative irradiation advisable? Several of the well known cancer centers are now in favor of pre-operative irradiation for breast cancer. The following four reasons are given:

I. Cancer tissue grafted under the skin in a region previously submitted to an erythema dose of irradiation, failed in a high percentage of cases; whereas a fragment taken from the same tumor and given a "cancer dose" of irradiation grew as well as a non-irradiated graft when imbedded under the skin of another mouse.

II. It permits the taking of biopsy without danger of stimulating the tumor, or implanting tumor cells in the skin wound.

III. Experience seems to show improvement in results.

IV. By diminishing peri-tumoral infiltration irradiation may make an inoperable condition operable, and by lessening the virulence of the growth it reduces danger that surgical intervention will spread the cancer. The benefit claimed from post-operative irradiation is destruction of cancer cells left behind at operation or not yet visible as metastases.

We have no method of determining the influences of the environment upon the tumor, or whether the case will be benefited by irradiation or not. Therefore, it is advisable to treat all cases. The most serious charge against irradiation therapy is that it causes damage to the lung tissue. This will occur when massive doses of deep therapy are used. Consequently the present method is that of moderate Kilo-voltage and fractional dosage with the tangential method of directing the rays. This will give the necessary and adequate protection to the lung tissue to avoid fibrotic changes. The careless radio therapist, like the rough handed surgeon, may cause damage. When properly applied irradiation does not affect the operability of the breast by the production of fibrotic tissue. It rather causes a shrinkage of the congested tissues and the tumor becomes more mobile. It does not interfere with post-operative wound healing.

In order to show the results that are accomplished in the irradiation therapy of the breast it is necessary to give a few statistics. Dr. Pfahler, one of our foremost radiologists, states: "All cases should have prophylactic irradiation after operation." Of the 263 cases referred for post-operative irradiation there were 55 per cent five years recoveries, and if from these is eliminated 49 cases in which the disease was confined to the breast, there remains 191 cases under observation for five years or more, and of these there were 46.6 per cent five year recoveries in advanced carcinoma, which is more than twice the average recoveries from surgery alone when there are palpable lymph nodes. From Bier's surgical clinic in Germany post-operative irradiation is strongly advised. Statistics show a five year cure rate of 28.4 per cent and a ten year cure rate of 17.3 per cent for patients treated by surgery alone; the corresponding rates for patients given post-operative irradiation being 37.9 and 22.1 per cent. The University of Frankfurt claims 68.7 per cent five year recoveries by surgery and irradiation. From the Cleveland Clinic (U.S.A.) in 103 consecutive cases they claim 40 per cent five year recoveries and moderate therapy technique. From Bellevue Hospital, New York, in 199 cases of mammary cancer, 37 were treated by *irradiation only*; of these 36.3 per cent have survived for five years; 137 cases treated by surgery and irradiation 40.6 per cent survived the five year period. A further 23 cases were treated by surgery only, of which ten per cent are living at the end of five years. As a general rule an average of five year cure occurs in 35 per cent of cases of radical mastectomy.

The numerous statistics and conclusions that are at this time available are convincing facts as to the advisability of irradiation therapy in

(Continued on Page 293)

The Control of Scarlet Fever Among Adults*

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SCARLET fever is of as great interest to you, who are responsible for the health of young adults, as it is to pediatricians. It is one of the oldest diseases. The earliest medical manuscripts contain descriptions of acute diseases accompanied by rashes resembling scarlet fever. But it was not until 1675 that Sydenham differentiated scarlet fever from measles and gave it the name of febris scarlatina.

Since that time our knowledge of scarlet fever has been derived from two sources; clinical observation and laboratory investigation. Until the last decade clinical observation had been more fruitful than laboratory studies. It taught that:

1. Scarlet fever is contagious.

2. That the period of contagion is considerably longer than in most acute diseases, being more nearly coincident with the time required for desquamation. This gave rise to the common belief that the skin scales harbored the virus of the disease—a theory now known to be erroneous. The prolonged period of contagiousness is due to the fact that the convalescent scarlet fever patient continues to harbor the scarlet fever microbe in his nose and throat long past the acute stage of the disease.

3. It was learned that survival of the acute stage of scarlet fever does not ensure against death from complications or sequelae.

4. It was noted that some persons go through life without having a recognized attack of scarlet fever despite repeated exposure to the contagion. This is now understood to be due to the development of immunity through repeated attacks of scarlet fever sore throat.

5. The disease was found to vary greatly in severity in the various epidemics and in different individuals in the same epidemic.

6. The fact that discharges from suppurative complications are contagious became accepted.

7. Experience taught that one attack of scarlet fever usually confers a life long immunity, but that relapses and second attacks may occur.

8. Occasional attacks of scarlet fever resulting from indirect exposure were reported. This gave rise to theories as to remarkable longevity of the virus in bedding and clothing. These theories are now known to be incorrect. The cases developing after indirect contact are due to contact with a healthy carrier of scarlet fever streptococci.

Thus by the end of the 18th century clinical knowledge of scarlet fever was well developed and important facts of practical value had been established, but the only known method of controlling the disease was quarantine. And quarantine was not giving particularly satisfactory results because the cause of the disease was not known; the importance of the convalescent and immune carriers was not recognized also there was no way of determining by means of cultures which persons should be held in quarantine.

A hundred years after Sydenham had established scarlet fever as a clinical entity, Jenner's work on smallpox vaccination stimulated those interested in scarlet fever to attempt vaccination against this disease in the hope of producing a mild form of scarlet fever which would protect against more severe attacks. In 1806, Becker, a German physician, published a book describing various methods of inoculation then in use, most of which originated in England. He especially recommended obtaining blood from a cut in the skin of a scarlet fever patient and rubbing it into scarifications on the arms of persons to be protected. Other materials used in a similar way were: Pulverised skin scales from desquamating cases, linen threads moistened in tears or saliva and exudates from the throats of scarlet fever patients. These methods proved impractical and were soon abandoned. They did not confer immunity without producing an attack of scarlet fever, and when the disease did result, it was often severe. Streptococcus vaccines and serums, subsequently tried, also failed.

In the latter part of the nineteenth century, the rapid development of bacteriology stimulated endeavours to find the causative organism of scarlet fever and a vast literature resulted which time does not permit reviewing here. None of the research resulted in knowledge of practical value in controlling the disease. Two and a half centuries after Sydenham's description medical science was still without any means, other than quarantine, for combating epidemics of scarlet fever.

*Presented before the American Student Health Association, Chicago, Ill., December 29, 1933.

In 1923 we reported the successful production of scarlet fever in human volunteers. The experimental disease was produced by swabbing the throat with pure cultures of hemolytic streptococci isolated from typical cases of scarlet fever. By suitable experiments we were able to exclude a filterable virus as the cause of the experimental disease. We succeeded in meeting all the requirements of Koch's laws, and thus established a specific hemolytic streptococcus as the etiologic organism of scarlet fever.

Further study showed that the characteristic symptoms of scarlet fever are caused by a potent —or toxin—manufactured by the scarlet fever streptococcus. It had been thought that true toxins were concerned in comparatively few diseases such as diphtheria, tetanus, botulism, and some forms of dysentery, all of which are caused by bacilli. The manufacture of soluble toxin by streptococci was a new conception. It explained the toxemia and the lasting immunity which had been considered incompatible with a streptococcus origin of scarlet fever.

Scarlet fever toxin and the corresponding antitoxin have furnished the means of controlling the disease through the development of:

1. A method of identifying scarlet fever streptococci through neutralization of their toxin by the specific antitoxin.
2. Control of quarantine by means of cultures on blood agar plates.
3. A skin test by means of which it is possible within twenty-four hours to determine which individuals in a group are susceptible to the disease.
4. A method of actively immunizing susceptible persons.
5. A specific scarlet fever antitoxin, useful in the treatment, prevention, and diagnosis of the disease.

Dilute solutions of the toxin are employed to determine susceptibility to scarlet fever. The toxin is first carefully standardized on human beings; for laboratory animals are so insusceptible as to be useless for this purpose.

The technic of the skin test for susceptibility to scarlet fever is exacting. Among the more common sources of error are: Inadequate syringes and needles; attempts to sterilize the syringes and needles with alcohol which precipitates the minute amount of toxin in the skin test solution; dilution of the toxin with water left in the syringe and needles after boiling; sterilization in alkaline tap water instead of distilled water; estimation of the amount of skin test solution injected by the size of the wheal produced instead of accurate measurement by graduation on the syringe; subcutaneous instead of intracutaneous injection, and failure to observe the reaction between twenty and twenty-four hours after the test is made. Slightly positive reactions are frequently interpreted as negative. This tendency may be due to familiarity with the Schick test, which is usually interpreted as negative unless indurated. Scarlet fever toxin does not cause induration. When induration is present, it is usually the result of infection from the skin or contaminated material, or it may be due to an excessive amount of protein in the toxin solution.

In making the skin test, the exact dose is injected intradermally on the flexor surface of the forearm at the junction of the upper and middle thirds. The reaction should be observed in a bright light, twenty-four hours after the test is made. Observations made later than twenty-four hours are not reliable. The slightest flush or reddening, no matter how faint the color, constitutes a positive reaction, if it measures as much as 10 mm. in any diameter. It is to be remembered that the test is one for susceptibility to scarlet fever and is not applicable to diagnosis of the disease.

The reliability of the skin test in determining susceptibility to scarlet fever is accepted. Our own experience of the past ten years comprises 24,000 persons having spontaneously negative reactions who have passed through one epidemic and some through several epidemics without contracting scarlet fever.

The most severe test of the reliability of the skin test is found in a group of more than 4,000 pupil nurses and internes with spontaneously negative skin tests, who were allowed to go on duty in contagious disease wards without immunization. Despite long and intimate exposure none of this group contracted scarlet fever. Retests made at intervals of three, four, and six years in spontaneously immune groups show that the skin test remains negative except in new-born infants, who frequently show negative skin reactions which become positive during the first year of life.

The incidence of immunity to scarlet fever after early infancy depends on conditions that favour exposure to the disease. Immunity is not related to age or sex except indirectly as these factors influence the frequency of contact with other people. The most important factor in the spontaneous development of immunity is crowding, which favours the transfer of contagion and immunization through infection. Figures showing the incidence of susceptibility to scarlet fever in one

group do not give an idea of what the incidence of susceptibility in another group might be, unless the living conditions are practically the same. In an over-crowded institution, the incidence of susceptibility may be as low as 10 per cent and in rural or suburban groups it may be as high as 85 per cent.

In a series of skin tests, it will be found that the positive reactions show all graduations from small areas of faint color to intensely red reactions 3 to 5 cm. in diameter. These differences in the intensity and size of the skin reactions correspond to differences in degree of susceptibility, and partly explains the great variation in severity of scarlet fever. The intermediate stages of the reaction also indicate that in many persons immunity to scarlet fever is acquired gradually through repeated infections with the streptococci of scarlet fever without the development of a typical attack of the disease. It has been learned that one attack of scarlet fever sore throat does not necessarily confer complete immunity, but typical attacks of scarlet fever usually do result in complete immunity, as indicated by negative skin reactions in patients convalescent from scarlet fever and by the comparative infrequency of second attacks.

Persons who are susceptible to scarlet fever may be immunized by means of subcutaneous injections of graduated doses of sterile scarlet fever toxin. In our experience, active immunization with graduated doses of sterile scarlet fever toxin in 13,000 susceptible persons caused no injury in any instance. In three institutions, urine analyses were made before, during, and after immunization. There was no evidence of nephritis caused by the immunization. Some persons who had nephritis were immunized without causing an exacerbation of the condition.

In a large series, including highly susceptible persons, general reactions may be expected after each dose in about 10 per cent. But this 10 per cent is not composed of the same individuals after the different doses. The most highly susceptible persons usually react more strongly on the first doses; others may not have any reactions until the fourth or fifth dose is given. As a rule, reactions after the last and largest dose are fewer and milder than after the smaller first doses. The immunizing doses should be given in the proper sequence in order to avoid unnecessarily severe reactions. But mistakes have been made in which the last dose has been injected as the first dose and no fatalities have occurred.

The doses of sterile toxin for active immunization should be graduated, beginning with 500 skin test doses in the first injection and increasing to 80,000 to 100,000 skin test doses in the last. The injections are made subcutaneously at intervals of one week. If the full amount is given in each dose, the five doses may be counted on to immunize completely 96 per cent of susceptible persons, and to modify considerably the susceptibility of the rest. Two weeks after the last dose is given, another skin test is made, using 0.1 c.c. of the skin test solution or one skin test dose on the right arm, and 0.2 c.c. or two skin test doses, on the left arm. If the reaction on either arm is positive, the fifth dose is repeated. Unless the immunization is carried to the point of a negative skin reaction, complete protection against scarlet fever can not be expected, although the severity of a subsequent attack would be modified by the partial immunization.

The duration of active immunity, as well as the degree of immunity, depends on the amount of toxin injected. Retests made at intervals of one, two, three, five and six years indicate that more than 90 per cent of those immunized to the point of an entirely negative skin reaction retain their immunity. Between five and nine per cent slip back and require a second immunization.

Scarlet fever antitoxin is obtained from the blood of horses which have received gradually increasing doses of toxin over a period of several months. The serum is separated, aged, refined and concentrated. The incidence of serum reactions following the administration of scarlet fever antitoxin is slightly less than following the administration of other antitoxins, due probably to greater care in preparation.

The potency of scarlet fever antitoxin is determined by its capacity to neutralize the toxin. One neutralizing unit of scarlet fever antitoxin is the amount sufficient to neutralize one skin test dose of the toxin and hold it in combination at least forty-eight hours.

Scarlet fever antitoxin is injected intramuscularly in prophylactic doses to confer a rapid, passive immunity on susceptible persons who have recently been exposed. Since the immunity thus conferred does not last more than ten days to two weeks, active immunization with the toxin should be started one week after the prophylactic dose of antitoxin is administered. Skin tests should be made to determine which individuals are susceptible and in need of protection and, if possible, nose and throat cultures should be made on blood agar plates to learn which of the susceptibles are infected. It is advisable to give scarlet fever antitoxin even in mild cases, because it is known that complications are apt to

occur in mild as well as in more severe forms of the disease. If the attack is severe and the patient very toxic, two therapeutic doses of antitoxin should be given at once, and more after twelve hours if indicated. Given early and in adequate dosage, scarlet fever antitoxin gives brilliant results. The patient sometimes recovers so rapidly that the attending physician may wonder if he could have been mistaken in the diagnosis. But the longer the patient goes without antitoxin, the less he benefits from the antitoxin when it is given.

There is perhaps a tendency to be too complaisant regarding epidemics of mild scarlet fever. While the frequency of complications is recognized, the lasting injuries resulting from them are not fully appreciated. The complications are not confined to the severe cases as shown by observations in a series of 743 cases of scarlet fever of only moderate severity. Otitis media occurred in 15 per cent, nephritis in 4.7 per cent, cervical or peritonsillar abscess in three per cent and multiple arthritis in 12 per cent.

To control an epidemic, it is necessary to employ all of the measures described. Under ordinary conditions, not more than 10 per cent of those who come in contact with patients having scarlet fever become infected, but in institutions where the students are in contact with one another during most of the twenty-four hours, more than 50 per cent may become infected during a prolonged epidemic, and it may be expected that eventually most of those who are susceptible will develop scarlet fever in some form. Conditions in institutions in which the disease is epidemic are favorable for determining the efficacy of active immunization in controlling scarlet fever. A number of such institutions have been under our observation during the last seven years. Skin tests were made on every one, and those who were found susceptible were immunized with graduated doses of toxin. Among 12,584 susceptible persons thus immunized in institutions where scarlet fever was epidemic, no case of scarlet fever occurred. Controls were furnished by typical cases of scarlet fever developing in newly admitted persons who had not been tested and immunized before they were introduced into the infected community, and by cases of scarlet fever in teachers and attendants who refused immunization.

An opportunity to study the results of active immunization was also found in 3,000 susceptible nurses and internes immunized before they began work in hospitals for patients with contagious diseases. These artificially immunized persons had the same prolonged and intimate exposure to scarlet fever that the naturally immune nurse and internes had. None contracted the disease. Controls in this group were furnished by thirty-seven cases of scarlet fever in nurses and internes who entered before they had been tested for susceptibility or who were known to have positive skin reactions and had not been immunized.

Since persons who are immune to scarlet fever do not require protection, the administration of prophylactic doses of scarlet fever antitoxin to all persons who come in contact with cases of scarlet fever is not justified. If it is not possible to make skin tests and nose and throat cultures on blood agar plates to determine which of these persons need antitoxin, it is better to watch all of them closely and give a therapeutic dose of antitoxin on the development of any symptoms suggestive of scarlet fever.

When it is possible to make skin tests and cultures and to establish quarantine, separating infected from non-infected persons, active immunization of non-infected susceptible persons with graduated toxin injections may be started at once, and prophylactic doses of scarlet fever antitoxin may be given to the persons who are both susceptible and infected.

By means of nose and throat cultures on blood agar plates, skin tests for susceptibility, active immunization of susceptible persons with toxin and the use of antitoxin prophylactically in infected susceptibles, it is possible, in a group small enough to test and culture in one day, to bring an epidemic of scarlet fever under control in forty-eight hours.

Since we are here chiefly concerned with control of scarlet fever in adults of college age, I have collected statistics from four colleges and a number of training schools for nurses comprising more than 15,000 students. In three colleges and two schools of nursing, scarlet fever was epidemic at the time the work was undertaken. In two of these groups the epidemic began with scattered cases, but after a few weeks there was an explosive outbreak. These mass infections were found to be due to carriers of scarlet fever streptococci handling the milk supply.

Quarantine was established between infected and non-infected persons on the basis of nose and throat cultures taken on blood agar plates. Cultures were repeated at weekly intervals. Most of the carriers got rid of the organisms in the first week; some in the second week; others in the third week. But at the end of six weeks there were still some chronic carriers. Such persons

may be a source of infection for at least several months.

It is because of the immune carriers that epidemics of scarlet fever are not satisfactorily controlled by quarantine unless it is based on cultures.

The incidence of susceptibility in the different schools ranged from 21.7 per cent to 49 per cent, averaging 32 per cent in the whole group of 15,000 young adults.

No cases of scarlet fever occurred in those who showed spontaneously negative skin tests. On the other hand 341 cases of scarlet fever occurred in persons who had not been immunized. Most of these had not been tested. Some had been tested and found susceptible but refused immunization. Others had positive skin tests and positive cultures indicating that they were susceptible and already infected so that they developed the disease before there was time to immunize them.

These results show that:

No individual need have scarlet fever.

No school need have an epidemic of scarlet fever.

If an epidemic starts it may be controlled with a few days.

PRESENT STATUS OF IRRADIATION THERAPY IN CANCER OF THE BREAST

(*Continued from Page 288*)

mammary cancer. Whether pre or post-operative irradiation, or both, should be given is not yet generally agreed upon. But the condition of the patient and the extent of tumor involvement must be considered before deciding the amount of therapy to be administered.

Radium therapy is applied either in the form of interstitial irradiation, or with the so-called radium bomb, but is much less used than X-ray therapy even at those centers where radium is available.

If pre-operative irradiation is given it is advisable to wait about three weeks before operating. Post-operative therapy is begun as soon as the wound has healed. The treatment is given over the breast, over the supra-claviculer and axillary areas on the affected side. The divided dose method is preferable as this is more apt to reach the greatest number of cells in the mitotic stage, besides its cumulative effect on the latent cells. A course of three treatments are given at a month's interval. The patient should then report twice a year for examination.

Inoperable and recurrent cases should all be treated for the palliative effect that may be secured. In these cases the distressing symptoms are often eliminated and great relief obtained.

Skeletal metastasis most often occurs in the lumbar vertebrae, the sacroiliac synchondrosis, extending to the ilium, the pubic rami and to the femoral bones. As a rule bone metastasis reacts well to X-ray therapy and gives very effective palliative results. Besides this calcium, phosphorus or ergosterol for stimulating bone repair may be given, and supporting jackets in spinal cases. I might also mention that I have seen permanent improvement by reduction in swelling, of the swollen arms that are so often seen after a radical operation. This is likely brought about by the softening influence of irradiation upon the cicatricial tissue in the axillary wound.

Prophylactic irradiation is at the present time universally accepted as a standard method of treating all cases of mammary malignancy, irrespective of whether surgical or non-surgical indications are present.

The Relation of College Health Services to the Private Practice of Medicine*

Harold S. Diehl, M.D.
University of Minnesota

IT IS indeed unfortunate for us that Dr. Morris Fishbein is unable to be here today to present his ideas as to what the proper relationship between the private practitioners of medicine, whom he represents, and the college health services, which we represent, should be. On several occasions it has been my privilege to discuss this subject informally with Dr. Fishbein, and I regret exceedingly that all of you cannot hear and discuss with him his ideas upon this important subject, because it is just through such exchange of ideas that misunderstandings can be eliminated and points of view harmonized.

In calling upon me, our president, Dr. Smiley, stated that he wished me to present this subject which Dr. Fishbein was to have discussed. I hesitate to do this, but I will try to comply with Dr. Smiley's request upon one condition, and that is that we make a special effort next year to have Dr. Fishbein meet with us to give us his point of view upon this subject to which I know he has given much thought.

To begin with, I should like to make it perfectly clear that I do not consider that the private practitioners of medicine and our Student Health Services are opposition groups. We are all members of the same profession, and whether we are engaged in Student Health work or in the private practice of medicine, the welfare of the profession as a whole cannot but affect each and every one of us. Naturally, on certain questions, our points of view will be somewhat different, but our objectives and ultimate interests are the same.

The reasons for the establishment of Health Services in our colleges and universities has just been presented very clearly by our president, Dr. Smiley, and whether we like it or not, I think that we may as well admit that college health services are here to stay. Our Boards of Trustees or Boards of Regents feel that they have a responsibility to safeguard, and, in certain instances, to try to improve the health and physical welfare of the thousands of students who make our colleges and universities their homes during the first years that they leave their parental roofs. Our problem, as I see it, is to find the best means of discharging our responsibilities to these young people, and at the same time interfere as little as possible with the private practitioners of medicine in our several communities.

As Dr. Smiley has said, the chief objective of our work is educational. To this principle there certainly can be little, if any, objection. Actually, however, those of us who have had experience in Health Service work know that the most effective health instruction that we do is at the same time that students come to us for medical advice, medical care, or health examinations. It is perfectly natural for college students, like the rest of us, to be most acutely interested in health when it seems that there is a possibility of losing it. It is then that students become interested not only in regaining health but also in learning how to preserve it once it has been recovered. Furthermore, one of our most important tasks in health education is to teach the public to appreciate and to secure adequate medical attention when they are ill, and certainly no amount of didactic presentation could be as effective in accomplishing this purpose as the contact which students have during their college courses with good medical care at the college Health Service. After such experience these students will no longer be prospective clients of charlatans or quacks; neither will they be satisfied with inferior medical service from physicians.

Another phase of Student Health work is the physical examination of students. Could these examinations be satisfactorily performed by requiring students to go to private practitioners for them? In our state universities I am perfectly certain that we could neither adopt nor enforce a requirement of this sort. But even if we could, many of the students could not afford complete and thorough physical examinations, and many who could afford them would not receive them. Tuberculin tests, with x-rays of positive reactors, tests of hearing, color vision, et cetera, would be the exception rather than the rule in such examinations. So it would not seem practical for us to have these examinations done by the individual physicians to whom students might go. However, in the conduct of periodic health examinations the Health Service can frequently utilize to advantage physicians who are in private practice.

Another aspect of Health Service work con-

*Presented before the American Student Health Association, Chicago, Ill., December 28, 1933.

cerning which there could be little, if any, objection is the control of communicable disease. Intimately related to this, however, is the care of the students who develop communicable diseases while in college. In most communities in which colleges are located, the hospitals for the care of communicable disease are so inadequate that college students frequently are refused admission to them. Consequently, colleges are forced to provide facilities for the care of students with such diseases. Effective control of communicable diseases, however, depends not so much upon isolation as upon early diagnosis, and our Health Service dispensaries, to which students come for medical advice and the care of minor symptoms, are the most effective instruments that we have for the early diagnosis of diseases in the student body. Practically never, in those colleges which have effective Health Services, do we find students reporting with fully developed cases of contagious disease. Each year, of course some cases of scarlet fever, measles, chicken-pox, et cetera, develop, but epidemics do not follow because the cases are practically always isolated in the Students' Hospital or Infirmary during the prodromal stages of the disease.

Next we come to a phase of Health Service work which is more controversial. This is the provision of medical care. Is this a proper function of Health Service? Personally, I believe it is, because we are rendering medical care at a time that disease is in its incipiency and it is possible, in many instances, to prevent the development of serious complications. Sir George Newman says in his recent book, "The Rise of Preventive Medicine": "It is a matter of common knowledge or experience that curative medicine and preventive medicine inevitably and appropriately overlap, and practice may be at one and the same time curative, preventive and constructive in tendency." Such certainly is the experience of Health Services which provide medical service for college students.

It is in the rendering of medical care in our Health Service Dispensaries that we see the early stages of scarlet fever, diphtheria, pneumonia, and appendicitis, and treat the minor infections, such as colds, boils, et cetera, which would otherwise go unattended. Some time ago I looked over a list of consecutive diagnoses on students who came to our Health Service Dispensary, and a conservative estimate is that not ten per cent of these students would have seen physicians if the Health Service had not provided medical service for them. I think, too, that the experience of most of us when we were undergraduates would indicate that unless colleges make medical service available, students receive it only in emergencies. In our undergraduate days scarlet fever was diagnosed only when fully developed in some dormitory or rooming-house; minor infections were cared for by friends who may have been contemplating the study of medicine; and appendicitis was usually treated by a cathartic obtained at the local drug store. Vision was not tested, and eyes were not refracted. Such situations are neither good medicine, good public health, nor good education, nor do they represent the sort of situations into which any of us today would willingly send our own sons and daughters.

The provision of medical care by colleges and universities unquestionably does interfere somewhat with the practice of certain physicians in the university neighborhood but it interferes still more with the business of the optometrists and the dispensers of self-medications. Recently I was waited upon by a committee of optometrists who stated that they were about to take steps to prevent our Health Service from performing refractions for students or from referring students to oculists for refractions. Their reason was that they were licensed to practice optometry in the state, and that it was unfair to them as taxpayers to thus interfere with their legitimate business. Physicians, they felt, fare much better because we employ a considerable number of physicians on our staff while optometrists do not even get the business of filling the prescriptions for glasses which our oculists write.

This brings me to make a suggestion in regard to the composition of the Health Service staff which I believe is highly desirable; that is, that the Health Service utilize on its staff as many competent local practising physicians as possible. These practising physicians should be compensated for the time that they devote to Health Service work on approximately the same basis that the full-time members of the staff are paid. The presence on the staff of practising physicians will introduce their point of view into the organization and will make for better co-operation between the Health Service and the local medical profession. On our Health Service staff at the University of Minnesota we employ approximately two part-time practising physicians to every one full-time member of the staff.

The provision of the infirmary or hospital care is another service activity which most of our colleges and universities today have found it necessary to provide in order to get sick students out of dormitories or rooming-houses. Theoretically we might agree that the Health Service

should care only for certain types of cases, but practically it is impossible to determine whether a student who is admitted to the infirmary with a slight "cold" will later develop scarlet fever or pneumonia, and there is no way of preventing self-supporting students from developing appendicitis. However, it seems that we should be able to follow a policy in the provision of medical care which will safeguard the welfare of the students and at the same time not be unfair to the medical practitioners of the community. This can be accomplished first, by urging every student who needs hospital care, at least for a major illness, to procure the service of a private physician, if he can afford to do so; and, second, by employing practising physicians on a part-time basis to provide a considerable portion of the medical care which the Health Service itself renders. I am convinced that it is neither practical nor necessary to set up rigid economic standards for the admission of students to Health Service hospitals. The Health Service has nothing to gain by accepting responsibility for medical care which can be properly passed on to someone else, and when urged to do so, students and their families are practically always willing to obtain the services of private practising physicians, if they can arrange it.

We sometimes hear it stated that college Health Services tend to be unfair to the private practitioners of medicine. I agree that Health Services usually interfere, more or less, with the practice of certain physicians in the university community but the same activities provide practice for other members of our profession. Last year in our own university physicians of our community, part-time and full-time, received through the Health Service between $55,000 and $60,000 in salaries, an amount which I am certain is many times what the medical profession would have received from these same students if our Health Service did not exist. Furthermore, our students had the benefits of a first-class medical program instead of being left to shift for themselves in case of illness. So it seems to me that both students and the medical profession are in a position to profit by the existence of properly organized Student Health Service programs.

Another suggested danger of our college Health Service is that they may serve as examples of socialized medicine. This criticism is difficult to answer, because I know of no way to measure the importance of this example, if it actually has any importance at all. I doubt, however, whether this objection would carry much weight with Boards of Regents, if it were proposed to them as a reason for modifying college health programs. Universities, as a whole, are socialized institutions, but I do not believe there has been any particular tendency on the part of students to carry over into later life the types of activities and organizations in which they participated in college. However, some of this implied objection can be eliminated if the special fees which are paid by students for the support of college Health Services would be incorporated with other incidental or tuition fees instead of being set apart as special health fees. If this is done the possibility that students may get erroneous impressions as to the amount of medical service which a given expenditure should purchase will be removed.

In conclusion, let me summarize the point of view which I personally hold and which I have attempted to set forth, by saying that I believe that college Health Services and private practitioners of medicine each have a distinct place in university communities and that it should be possible for them to work together in a manner which will be mutually advantageous.

Urologic Clinic*

Charles Morgan McKenna, M.D.†
Chicago, Ill.

THE first case is a boy of 16 years of age, who was operated on by Dr. Pierson, for a stone in the bladder. His history of stone in the bladder was characteristic of patients suffering with this entity, namely, he always had pain at the beginning of urination and pain at the end of urination. Inasmuch as the stone was round and smooth, he did not pass any fragments of sand or crystals, he passed very little macroscopical blood. The patient was cystoscoped and a diagnosis of stone was made. After careful observation the doctor decided to remove the stone by crushing it with a lithotrite. After the stone was crushed and all small particles removed with a Bigelow syringe, he was again cystoscoped and the rest of the larger particles were crushed under vision. Of course, this is the ideal way to crush a stone. The doctor was absolutely correct in doing a blind crushing, inasmuch as he was dealing with a smooth stone and one that was not attached to the bladder mucosa. After the stone was engaged in the jaws of the lithotrite, he could move the lithotrite around in the bladder, and was sure that he had not attached the mucosa of the bladder in his grasp. The patient made an uneventful recovery, and has had no symptoms since. I would like to add that in dealing with a stone of this size I would consider very much the question of doing a suprapubic cystotomy, especially if the stone was attached to the bladder mucosa, and if it would give one difficulty in grasping the stone with a blind lithotrite. I think much care should be exercised in doing a blind crushing, especially in an infected bladder, because it is so easy to have a part of the bladder mucosa in the jaws of the lithotrite, and in that way make an opening into the bladder which may or may not extend into the peritoneal cavity; so I would conclude by saying the management of bladder stone depends on the size of the stone, the character of the stone, and whether or not the patient has a cystitis. This patient made an excellent recovery, and the doctor is to be congratulated in managing it as he did. In all patients suffering with a stone in the bladder one must not forget to look for a diverticulum. Diverticulum may even be missed with the cystoscope, so it is well to make an X-ray picture, not only anterior posteriorally, but laterally as well. This should be made first, on a flat plate and then do a cystogram, because the stone may have been in the diverticulum and at the time of operation be seen in the bladder proper, and again this may remove from the bladder and have a stone or multiple stones in the diverticulum. In all cases we believe it is wise to explore the bladder well if an open operation is done, otherwise a lateral view made by X-ray.

The next two cases represents two types of cases suffering with vesicle neck obstruction. At the present time there is a considerable amount of controversy as to the best method of handling vesicle neck obstruction. I might add while there has always been considerable argument among urologists as to which is the better route, suprapubic or perineal. Now, we have had for some time the third method, which is transurethral resection. I have heard a good many heated arguments concerning this method, as to whether or not it was applicable to all cases. Some urologists have gone on record as stating, "They will never do a prostatectomy again, but would use the resectoscope instead." At the Cook County Hospital and the Research Hospital in Chicago, all three methods are used, which depends on the type of pathology we are dealing with. Several hundred resections have been done at the Cook County Hospital, and yet both the other two methods are employed. We do not believe that every case should be resected, and before taking up the matter of resection further, I should like to emphasize this point, the removal of the prostate gland either by resection or any other method is a major procedure. The pre-operative care is just exactly the same as when the entire prostate is to be removed, and by no means this method of operation should be considered a minor procedure. The post-operative care should be exactly the same as in an open operation. I cannot dwell too long or emphasize too much concerning the seriousness of transurethral resection. It is ideally applicable in prostatic bars, median lobe obstruction, small fibrous prostate and moderately sized tri-lobular prostate. It has a great many advantages, it is usually always done under caudal anesthesia, sometimes spinal, and the stay in the hospital is

*Given at a meeting of the Sioux Falls Medical Association, Sioux City, Iowa, January 23, 1934.

†Head of the Department of Urology, College of Medicine, University of Illinois.

usually much shorter than the open operation. We have seen both, at the County Hospital and the Research Hospital, patients coming to our clinic, who had been resected and in a few instances there had not been sufficient amount of prostatic gland material removed or the removal was at the wrong place. I recall two cases which have been reported that came into the hospital suffering with prostatic gland trouble. In both cases a pin point opening was found in the neck of the bladder. In other words, both lateral lobes were shaved high up and an anastomosis took place between the two lobes and a contraction followed which gave a very small opening into the posterior urethra. We believe that every case should be studied and decided which is the better method in management of vesicle neck obstruction. We believe that it should be done at the hands of one who is trained in cystoscopy and an excellent urological surgeon. We do not believe that the patient should be sent from the operating room after the resection, bleeding, and the water returned from the bladder after operation should be clear. One must not forget that complications may happen after transurethral resection just the same as after the open operation. I mention those points particularly because there has been so much misleading literature concerning this procedure.

We have been in the habit for some time of introducing into the bladder, following a transurethral resection, a urethral catheter for drainage. For some time we left that catheter in as long as eight or nine days. I found from experience that a few days is sufficient. I have seen patients develop very high fever from a retention catheter, in fact from the postmortem report, ulcers were found through the urethra from a retention catheter. We believe it is always a good plan to fill the bladder at the time the urethal catheter is removed, to find out if the patient can empty the bladder. The residual urine should be measured both before operation and afterwards. Both those cases have gotten very satisfactory results. Time will not permit to discuss this subject longer.

The next case is one that it gives me great pleasure to present. It is a case of a man suffering with traumatic kidney. This man when injured had no external abrasions. The doctor did not have any catheter or a cystoscope to do a retrograde pyelogram, inasmuch as he was far out in the country. He did, however, have some skiodan and did an intravenous pyelogram, and was able to estimate immediately the condition of the kidney. In this particular case he did not operate, which in my opinion was excellent judgment. When a kidney is injured, the following points should be taken into consideration: Are you dealing with a case that has the rupture within the kidney itself; are you dealing with an extra capsular rupture, or are you dealing with a peritoneal tear? The time has gone by when one need not put in long hours of watchful waiting. We have reported a number of cases of this kind, in which we were able to tell the extent of the injury to the kidney. Sometimes a negative report is just as valuable as a positive one; by that I mean where the kidney is blocked out entirely with a skiodan with a good function on the other side, that means surgical intervention is indicated. Such an article will appear in the American Medical Association Journal concerning those reports. It is not always necessary to remove every kidney that is ruptured. Many times the clots may be removed, the kidney sutured, and the patient will make an uneventful recovery. When the kidney is completely divided or where there is a intra-peritoneal tear, it is usually necessary to do a total nephrectomy. The question of shock must be taken into consideration at the time the patient is to have an X-ray picture made. I do not believe it is good judgment to give a patient skiodan if he is in extreme shock. I could spend the rest of this morning on this subject. There are others to follow, and I will close by saying I congratulate Dr. Pierson in the management of the cases.

Thank you very much.

The Significance of Macroscopical and Microscopical Blood in the Urine‡

Inasmuch as I have taken so much time already, I will confine my remarks to the significance of macroscopical and microscopical blood in the urine. Some years ago I wrote an article and stated that blood in the urine was not only a sign or a symptom but was a warning. I cannot emphasize too much the significance of blood in the urine. It means that nature has a way of manifesting itself that there is some trouble somewhere in the urogenital tract. In other words it is a key for further investigation, and for convenience sake we will divide the urogenital tract into three separate divisions, namely: the urethra with its adnexa including the vesicle neck, the bladder proper, and the upper urogenital tract, including the ureter and the kidney. In the male, bleeding from the anterior urethra will be continuous and without clots, while bleeding from the posterior urethra will also be without clots, but the bleeding will not be continuous, while if the bleeding comes from the seminal vesicles it usually comes in clots and casts. Bleeding from

‡A synopsis of a talk given in the afternoon.

the seminal vesicles is usually rare, however, it is not uncommon to be able to express clots from them by rectal massage. The posterior urethra may have been bleeding from tumor, stone, papilloma or any form of malignancy. In this connection I should like to direct your attention to the female urethra. The most common tumors that we find in the female urethra is a caruncle, but I think we ought to be very careful on investigation of a caruncle, because many times what is apparently a caruncle may be the pouching of the mucosa, and on cystoscopic examination one finds the patient is suffering with a carcinoma of the bladder. Coming back to the male urogenital tract, bleeding may take place from a hypertrophy prostate or a stone either in the prostate or the bladder proper. One of the most common causes of hemorrhage from the bladder is papilloma. When bleeding occurs from the bladder an investigation should be made immediately. Metastasis takes place more slowly than from any other place and any other organ. I could cite a number of cases and much time has been lost with patients suffering with papilloma of the bladder. We believe all papilloma of the bladder is potentially malignant, and once the patient bleeds from papilloma of the bladder, they will bleed again. This may not take place for a week, a month or a year, or maybe two years, but they will bleed again, and during the interim the tumor is growing and making it a worse risk than when you first saw the patient. Papilloma in contrast to carcinoma bleeds very early. Carcinoma of the bladder may be well advanced before any hemorrhage takes place at all, and then it is almost impossible to control. Many patients have taken medicine or pills for hemorrhage from the bladder, and the hemorrhage coincidently stopped. That was purely a coincidence, because the pills and the medicine had no control on the bladder hemorrhage. A few weeks ago we operated upon a man who gave a history of having a bladder hemorrhage four years ago. He went to a drug store and he said the bleeding immediately stopped after taking pills. A year later he had some more bleeding and took some pills and it stopped in a few days, and he was sold on the idea that the medicine stopped the bleeding. A year later when he had bleeding again the hemorrhage could not be controlled with pills or medicine, and he was sent in for an investigation, at which time he had a tumor the size of a golf ball. That in itself is an example, because that means the bleeding should have been controlled the first time that blood was evident in the urine. Instead of fulgurating the tumor through a cystoscope, it was necessary to open the bladder and do a resection of the bladder. I could enumerate a number of such cases. I cannot recall exactly, but I think in twenty cases it was between seven and ten months after the initial bleeding that the patient reported for an investigation as to the cause of the bleeding. The same is exactly true concerning bleeding from the kidney. It means further investigation, it means a cystoscopic examination, it means a pyelogram with X-ray pictures. In other words any patient who gives a history of bleeding must be investigated, and the sooner the investigation takes place, the better chance the patient has of getting well, and in conclusion, hematuria may be painful or painless, but in either case, investigate.

Thank you very much.

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84 South Tenth Street, Minneapolis, Minnesota

MINNEAPOLIS, MINN., MAY 15, 1934

TAX REACTIONS

Income, that is nice; and Texes isn't bad; but speak of income Texes, and don't it make some mad.

Here's an interesting study in psychology. The doctor whose income is so large that he must pay a tax, instead of being pleased about it, cusses and discusses the "imposition" with boisterous vociferation and a beclouded mien. He, on the contrary, whose meager allotment from the spout of economic distribution does not overflow the legally prescribed measure of exemption, throws his hat in the air and voices his approval in shouts of lusty joy.

It is a paradox, on the Frankenstein order, that a fortune although fairly assiduously and unselfishly amassed, often turns to chafe its creator. There seems to be an automatic adjustment somehow that saves us from our very selves.

A. E. H.

WILLIAM H. WELCH

The death of Dr. William H. Welch on April 30, brought to a close the career of one of the most important figures in scientific medicine, a long life signalized by outstanding achievement in various fields. Beginning his professional work at a time when pathology and bacteriology were in their infancy and early sensing the great influence these two activities were to play in the development of medicine Dr. Welch decided that the laboratory rather than a life of purely clinical work offered greater possibilities of usefulness and thus he became a pioneer in bringing the fruits of scientific research to the aid of the bedside and the operating room. To prepare himself for this great task he spent several years at the outset of his career with the great masters whose names have become household words in the domain of laboratory research and then in turn he himself became a great teacher and played a leading part in the establishment of the foremost teaching center in this country. He did much original research in morbid anatomy, infections and immunity and turned his knowledge to good account in the larger fields of hygiene, public health and preventive medicine. His services were widely sought in organizations covering these various activities and he was highly influential in an advisory capacity in connection with foundations and endowments created for the advancement of scientific medicine in the investigation and control of disease in all parts of the world. He became active in the American Medical Association, serving as its president in 1910-1911, was recognized by honorary membership in many foreign organizations and received honorary degrees from a number of foreign universities as well as from those in the United States.

His influence as a scientific leader was worldwide in its scope. Besides this he possessed a remarkable charm of personality which endeared

him alike to associates, students and all others with whom he had contact. He was an educated man in every sense of the term, with broad grasp and insight into art, music and literature to a degree seldom seen in a man whose life work was in other professions. With all these attributes he was modest and unassuming, unspoiled by the honors and recognition which had come to him, an altruist of the best sort.

The scope of this little editorial does not permit of any attempt at a summary of the details of Dr. Welch's career but it is the hope of this writer that some capable biographer will undertake the work of setting forth these matters in their proper proportion and perspective, as did Cushing for Osler, and then in these fifty years of splendid scientific activity we shall see a surpassing example of massive contribution by a man who deservedly stood very high in his chosen field and yielded freely of his gifts to humanity.

G. C.

DROUGHT, DUST AND POLLEN

Never, in the memory of man, has there been such an epidemic of dust borne "colds" as there was this Spring. The proverbial April showers did not materialize in this section and drought and high winds distributed infection to the upper air passages in generous dosage.

Microorganisms were aviators long before men ever thought of riding through space and in chariots of dust they still stage their periodic carnivals. The sinus feasting aggregations have been particularly busy of late and it has been a long, stubborn fight to protect against invasion these inner chambers.

Just as the dry, superheated air of apartment buildings causes trouble in winter, so this dust laden air becomes a menace in the out of doors life of other seasons.

Soon we shall have the addition of pollen in the air, and it remains to be seen whether the unusually severe windstorms that preceded pollenization this summer will have the effect of further sensitizing or desensitizing the Schneiderian membranes.

A. E. H.

ANOTHER MEDICAL PHALANX

After creation, the greatest thing in life is regeneration because this sequence gives the world perpetual youth.

When old men become pessimistic and bemoan the times and the customs as they have been doing since the days of ancient Rome, then optimistic youth, unprejudiced by any experience with previous conditions or change, arrives upon the scene and accepts the challenge of things as they are.

Physicians of succeeding generations have always had a strong bond of affection for each other. The new graduates must have found something to respect in the lives of those who preceded them. This led them to choose the profession. We, in turn, admire them because they must have something noble within, that responds to an appeal for service in the most unselfish and self-sacrificing calling that the world has ever known and whose traditions we have cherrished and endeavored to uphold before their advent. As we pass the torch to them we have confidence that its undimmed light will in turn be entrusted to worthy successors as long as time shall last.

As graduation time is here again, we prepare to receive the neophytes with a baptism of good will, and chalk up another year on our own service escutcheons.

A. E. H.

DIFFERENTIAL WHITE-CELL COUNTS IN TUBERCULOSIS

Until rather recently, it has been believed that little information either as to diagnosis or prognosis in tuberculosis could be gained by blood studies. However, Arneth[1] and Schilling[2] have called attention to the significance of differential leucocyte counts. Their studies, as well as those of a number of subsequent workers, were attempts to detect activity of disease before symptoms and physical signs appear. They divide the neutrophilic leucocytes into various classes.

Medlar[3] recently made a critical study of this subject and came to the conclusion that for practical purposes it is only necessary to consider two classes of neutrophiles, namely, nonsegmented and segmented. The nonsegmented are the immature cells and if they are present and are maintained on repeated examinations above 8 per cent, the count is abnormal and the higher the percentage of nonsegmented forms found, the more serious is the pathological condition. Inasmuch as such differential blood counts are not specific for tuberculosis, they become valuable only after this disease has been diagnosed by other methods. Their value lies in determining whether the disease is progressive; therefore, it may be used for this purpose soon after the diagnosis is made. Again, it is of value when definitely progressive cases are on treatment to

determine when the progressiveness of the lesion is subsiding.

Medlar[4] calls attention to the fact that in leucocyte counts one must consider each cell type in the light of the role it plays in the pathogenesis of the disease. For example, in tuberculosis the neutrophile plays the chief role in abscess formation and in extension of ulcers. The mononuclear leucocyte becomes important in new tubercle formation, while the lymphocyte predominates when there is healing of a tuberculous process. As yet, no definite role has been ascribed to the eosinophile or basophile in tuberculosis.

In 1925, Cunningham, Sabin, et al,[5] studied the cellular reactions of tuberculous rabbits and found that tuberculosis brings about a change chiefly in the monocytes. They reported not only an increase in the tissues of primitive reticular cells which they believed to be the early stage of the development of monocytes, but these cells were more rapidly matured into monocytes in tuberculous animals. In the blood, they also observed an increase in monocytes from 8 per cent to 53 per cent in tuberculous animals. This work was later confirmed with tuberculous guinea pigs, and later on tuberculous human beings. They found that the lymphocytes were decreased and the monocytes increased in most cases who showed evidence of progressive clinical disease.

Finner[6] made differential counts on 100 patients with pulmonary tuberculosis and found the monocytes increased in 87 per cent. In the remainder, the involvement was very slight or the disease apparently was not progressive. She found that in general the degree of progressiveness of the disease determines the elevation of the monocyte count and that the changes are definite enough to be of diagnostic and prognostic significance.

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J. A. M.

Proceedings of the Minneapolis Clinical Club

Regular Meeting, March 8, 1934

Vice-president Dr. Willard White in the Chair

Inaugural Dissertation

STEREOSCOPIC VISION

C. W. RUCKER, M.D.

SUMMARY

Stereoscopic vision is a true percept. It seems to have been a factor in the evolution of the Primates, and in man, the highest member of this group, it appears and becomes perfected during childhood. Because of its great aid in accurate work with the hands it is important that its significance be appreciated and that in the care of the eyes an effort be made to preserve it.

DISCUSSION

Dr. Erling Hansen: I think Dr. Rucker has given a very nice presentation of an important subject in ophthalmology and one that isn't touched on very much. The practical application of stereoscopic vision enters the picture when we have these youngsters who, early in life, begin to show a tendency toward lateral deviation of the eyes after the time when they should be developing biocular single vision. They may have either a convergent strabismus or an outward deviation of the eye. In most cases it means rather a high degree of refractive error, mostly so-called farsightedness, with or without astigmatism.

The importance to us is to recognize that in most cases they will not outgrow these things as most people are told by not only their grandmothers and friends, but apparently, in some cases, by their family physicians. We hear, "Give them a little more time" and while they are given more time to outgrow a crossing eye the vision in the turning eye, the one that is not being used, sometimes gradually and sometimes rapidly, deteriorates. When we see them even at an early age and are able to check their vision we find that one eye or the other is very poor and in many cases, at least, it is practically impossible to bring the vision to normal. These people do not develop stereoscopic vision. If we are to be of any help we must get them very early, insist on correction of refractive errors, and give such training as will help develop vision in both eyes.

As Dr. Rucker has shown, in a great many fields of endeavor stereoscopic vision is necessary to fine detailed work. There may be a little difference in stereoscopic vision and depth perception although they are practically one. Still, for aviation and driving a car, and things of that kind, depth perception, which is a part of stereoscopic vision, is very important. For all men who are entering the field of aviation, one of the tests they must pass is the ability to recognize a thing in depth. If they do not have stereoscopic vision and depth perception they are out of the running as far as licensing by any of the aeronautic boards is concerned.

Dr. D. D. Turnacliff: Following up the work that was done with the aviators, I attempted to find out whether or not there was any practical application for testing men on street-cars about three years ago. We went through the whole group of them and then turned the results over to the Operating Department to check against accidents. They were of the opinion that there was no practical application for it. The principal reason is that they have their training for years and they have the other objects for comparison, as Dr. Rucker brought out in the first part of his paper.

It is my impression that the distance perception test is of little practicable value for operators on the ground, but is of distinct value for aviators.

Dr. Walter H. Fink: I want to compliment Dr. Rucker on the excellent paper. It is very instructive. This paper stresses the importance of stereoscopic vision. I wish to bring out the fact that there are two schools of opinion on this subject. One group is thoroughly convinced that this subject is very important and that much can be done to develop it. The other group discourages it. This was particularly impressed upon me a year ago on visiting in New York—the different groups of men who took sides on the question. Some have no faith in exercising and developing —and the other group is enthusiastic about it. This latter opinion is gaining as the years go by.

In London they have a center where this problem is put on a scientific basis. The reports have not been brought out but from what I hear, much has been accomplished.

I want to stress the fact that there are a number of people who have monocular vision and who do not have this stereoscopic vision which is very necessary to carry out some lines of work such as driving an automobile or aviation. Even for the people past the age of six years much can be done to help them.

* * *

NON-ORGANIC CAUSES OF FATIGUE —A CONCEPT OF FUNDAMENTALS

NORMAN JOHNSON, M.D.

People consult doctors because one of two symptoms occur; either they have pain or they have fatigue. The fatigue may involve the whole constitution; or it may be the exhaustion of a single organ like the heart. Evaluation of the causes of fatigue, therefore, are almost as important diagnostically as evaluation of the causes of pain. Both pain and local or total fatigue may be the end result either of physical and material factors or of intangible and non-material influences. Obviously, if fatigue is the complaint which prompts the patient to ask for help, any attempt to treat a fatigue produced by non-material influences with a therapy designed to aid in fatigue brought about by physical factors cannot achieve great success.

Constitution fatigue is often a prominent symptom, and sometimes the first or the chief symptom, presenting in Addison's disease, Anemia, Myxedema, Coronary insufficiency, Renal insufficiency, Chronic sepsis, wasting diseases, focal infection, auto-intoxication and several other morbid states. The intent of this paper, however, is to offer a concept of the origin of functional causes for fatigue. From this concept, details of therapeutic attack may be developed. Within the allotted time there can be no elaboration or argument to support the theories offered. Of necessity, this presentation will contain only an abstract view of the main problem. Concrete example and specific detailed application of the concept can form the body of a later paper if such should be desirable.

We devote our existence as physicians toward maintaining, in those units of human machinery that happen to come our way, a degree of efficiency as close to that arbitrary standard called "normal" as our knowledge of the laws governing that machinery will permit. We are hampered in this by our limited knowledge of the fundamental principles governing his physiology. We should be curiously seeking to discover all the causes of disturbance in his physiologic efficiency. Whereas we can explain him somewhat in accordance with known laws of physics, of hydrostatics, of chemistry, of electricity, still these laws will not suffice. He is more than a machine. For one thing, he suffers pain and he has fatigue, which no machine experiences.

Let us analyze him as a unity, instead of by his component parts. He may be artificially divided into two imaginary halves with a vertical line of cleavage. On one side of this line is a chassis with a steering apparatus; on the other side is the plant which generates the motive power. On each side of this line are collections of living cells which are controlled by nerves (or electric wires) and these cells will respond to a stimulus with motion. Cells on either side of the line may experience fatigue as a result of over-stimulation.

The structural half with the steering attachment is the later development both embryologically and historically. It was not even necessary until the other half had been perfected and was in operation. Its motion is purposive and is prompted by thought—the outcome of logic or reason. It carries the human machine where he will go, plans his actions, and dictates his policies. It is controlled by the will as the dominant dictator. Being motivated by reason or logic, it requires—(1) education in the processes of logic and (2) grounding in the fundamental laws of the universe—in order that proper selective action may result. Both of these requirements are such recent acquisitions among the human accomplishments that the development of them is relatively infantile. We still reason too poorly and understand too few of the fundamental natural laws to steer our course with wisdom. The important point to remember is that the will selects, initiates, and dominates all action in this half of the human.

On the other side of this vertical line is the more primitive embryologic development. Its groups of cells, also controlled by nerves (electric wires), units to provide the energy requirements for the whole machine. They are the vegetative processes having to do with fuel, metabolism, heat, water balance, gas exchange and the like. Though linked by nerves to the same brain that controls the opposite side, there is absolutely no con-

trol of these cells by the will except in certain sphincters and, to some degree, in respiration. These organic structures are of necessity entirely automatic since they must operate whether the brain is conscious or unconscious. The human being on this side is governed solely through instinct or by impulse; and he was subject to such control long before education of the human mind in the processes of logic, or in knowledge of fundamental law, was begun. The dictator of the stimuli which pass down these wires, and set in motion (or into function) these cells, is the emotional side of this human machine.

The Art of Medicine is three or four thousand years old. The Science of Medicine is less than one hundred years old. It is not, therefore, to be wondered that our knowledge of the law which regulates this complex mechanism is fragmentary and much too inadequate to restore its efficiency to the "normal" each time it gets out of order. When the various mechanical units, or the parts thereof, or the chassis, or the wiring, or the dynamo, or its controls are damaged by accident or by disease, we understand enough fundamental law of physics, of chemistry, of electricity, of hydrostatics to be of some help. We are capable of alleviating that exhaustion brought about by damage to a part, by increased resistances, by variations in atmospheric (tissue) pressures, etc. We are not so cognizant of the possibility of a qualitative or quantitative alteration in the currents which pass over these wires, especially on that side where currents are generated, not at will but via the motions.

One must somehow explain in terms of disturbed physiology the alterations which have produced pain or fatigue even though these symptoms did not originate in material factors. No better explanation suggests itself for such "functional" disabilities than that of overstimulation of organic structures in this second division of the human machine. Either the afflicted individual is, by heritage or by training, unduly receptive to ordinary stimuli or he is forced to face an unusual amount of extraordinary stimuli. Since he cannot exercise selective control by will power over this part of his machinery, stimulation may be continuous and automatic to all groups of cells and he does not know how to shut off the current. It is on this basis that ultimate decompensation of some over-stimulated part occurs. We call it a "functional" ailment.

When, in a heart which has acquired certain disadvantages like incompetent valves, the well-known laws of physics and hydrostatics are violated, the resulting penalty is called decompensation. Because we know the law which was violated, we can back-track and teach the decompensated individual how to put things right and how to live in accordance with the law. It is my conviction that similar laws of conduct, of attitude, and of behavior are in existence and operative; that they may be searched for, found, and postulated; that each time they are violated, especially by someone with preexisting damage to his emotional-autonomic system, the resulting penalty will be decompensation either in the form of pain, exhaustion of function in some local organ, or constitutional fatigue; that the proper therapy can come only through—(1) the establishment of such laws of conduct and then (2) by instruction of the patient in the art of living in conformity with such law.

In the case of constitutional exhaustion produced by non-organic influences, there seems to be one fundamental premise upon which the formulation of any such laws of conduct must rest. Man gets his greatest physical strength—his superhuman abilities—at those times when his impulse or instinct strongly urges some policy and his will gives its full approval of that policy. Conversely, he may experience utter and complete fatigue whenever his impulse or instinct strongly dictates a policy and his will violently disapproves such a move. Let us examine some paradoxes of human machinery.

(A) A strong and robust, conscientious, college-bred young man goes to war. Repeatedly he experiences this conflict within him between will and impulse. The latter urges self-preservation and flight; the former demands exercise of duty and acceptance of danger. Ultimately this personal conflict results in a physical weakness even more severe than that of Addison's disease. This soldier boy, years later, may still be unable to stand on his feet. And yet, if he is hypnotized and told he has great strength, he has the ability to break up the furniture. Strength is there but he cannot call upon it. Only when he is in an hypnotic state is he urged by an impulse which finds his will giving its approval. In his ordinary state, each of these potent forces is no longer on speaking terms with the other. But this example is too dramatic, both in the situation which created it and in the resulting disability. There are more commonplace situations and lesser degrees of fatigue occurring in everyday life.

(B) A middle-age woman in a small Minnesota town had had a "nervous breakdown." The causes behind the breakdown are not known and are not important to this particular experience. Since her breakdown she had remained unusually tired and easily fatiguable. When the neighbors urged her to attend the Ladies' Aid Meetings, she sweetly replied that he would love to but they fatigued her so badly that she always had to spend the next day in bed. One afternoon as she sat in her rocker, the basement plumbing burst. Water sprayed over her fruit closet and covered the floor to the level of the first step. Her husband could not be located. Then, for two hours until help came, she was able to carry jugs and pails of water. She did not remember feeling any the worse next day. Here again, when this woman's impulse strongly urged a policy to which her will gave its unqualified approval, she was somehow endowed with strength enough for the work, but lacking this unanimity of forces, she was unable to attend a simple meeting without disaster.

(C) A doctor, who, before depression, had a good practice and a moderate income, has always taken great joy in his work. Of late he finds more and more people making demands upon him without being able to repay him for services. Though calls and work increase, the income decreases. To supplement income, he adds a few hours daily of contract practice. He soon finds his days very full. Whereas he used to enjoy his medical or surgical problems, he now finds that he is too

crowded—has too many calls made upon his time. Instead of being keen for the next case, he finds a tendency to resent being asked to give services. He even detests the contract work not so much because of the work itself as because of the necessity of keeping at it. He feels fatigue in unusual degree as the day comes to an end. He hates each new case, or the ringing of a telephone bell. If he were a patient, he might consult a doctor because he felt so "rundown." And that doctor would probably tell him that those dead teeth ought to come out; and that he was working too hard; and that he ought to stop worrying; or perhaps that he ought to take a good long vacation. However practical to him the last suggestion may be, it probably has more merit than all the others. The hero of this tale no doubt feels overworked and unjustly treated. As a matter of fact his fatigue is due not nearly so much to the number of foot-pounds of energy output per day as it is to the attitude he has assumed toward his day. He has been persistently violating at least three fundamental laws of conduct, and the penalty is just as inevitable as if he had persistently violated the law of gravity. Chronic constitutional fatigue is really a small sentence to serve for violation of a natural law.

Our exhausted hero enjoys golf so we shall give him a course and turn him loose. In order to maintain constant experimental conditions, he moves less than one day's journey away from the scene of his labors. Within the next twenty-four hours, as he propels the elusive ball with weapons poorly suited for the purpose, this badly fatigued body will more than double the number of foot-pounds of energy output per diem. Although there had been rebellion because of the low monetary return per unit energy output, it should be noted that in the new experiment all income has ceased. In fact, surplus is being drained. Moreover, his enthusiasm and egotism over his game may cost him more than his green fees. The chief factors which had produced fatigue 48 hours previously are still present; some are increased; yet there is no fatigue. The one important variable present in the new situation to dispel fatigue may be found in the altered relationship between will and impulse. Previously, will had forced work when he had no compelling impulse to continue. Now impulse is dictating a policy to which will gives its unanimous consent. It is under such favorable circumstances that the human machinery operates at its greatest efficiency.

CONCLUSIONS

A concept of the fundamental discrepancy underlying functional disorders of human physiology has been suggested with special reference to factors promoting fatigue. Therapy of such disorders, based upon such a hypothesis, may be built up along two suggested lines:

(1) A premise that there are in existence basic laws of human conduct which, when violated, result in emotional overstimulation and in consequent overstimulation of organs to a point of exhaustion.

(2) The human necessity for an absolute amalgamation between will and impulse—the two strongest driving forces which impel man to action—in order to avoid fatigue.

DISCUSSION

Dr. M. H. Nathanson: It is certainly true that fatigue, as it occurs in patients, is frequently psychogenic in origin, as pointed out by Dr. Johnson. Nevertheless, we should look for some explanation of the symptom in terms of pathologic physiology. For example, abdominal pain is very often of psychic origin and yet we can frequently explain the pain by abnormal motor function of the bowel which we now call spastic irritable colon. In the same way there should be some physiological explanation for fatigue.

There is very little question that fatigue, as it occurs in patients, is unlike fatigue that we all produced in the physiological laboratory. We stimulated a muscle strip with an electric current, the muscle gradually lost its response and, upon examination, showed an excess of lactic acid. It would appear to me that clinical fatigue is undoubtedly circulatory in origin. I have felt this way ever since I saw Krogh's moving pictures of the capillaries in muscle. The remarkable thing is the small number of capillaries that are open when the muscle is at rest and the reaction in numbers and speed with which the remaining capillaries open up when the muscle becomes active. Fatigue can well be explained by an abnormal response to this mechanism whereby there is an improper shifting of the blood to particular organs where there is a demand made upon them. It is well known that a sensation of fatigue occurs rapidly for example, in muscle when the circulattion is interfered with. This mechanism for clinical fatigue would explain the good result often obtained by exercise and massage and would also contraindicate forced rest in these patients.

Dr. Lawrence R. Boies: In a public dispensary, a large proportion of patients who complain of the symptom of headache eventually get to the Nose and Throat Section. A most popular tentative diagnosis of "Sinus Disease" has been made. Consultation is cheap in a public dispensary and this patient has usually seen the Eye Section, the Neurologist, and has been x-rayed in addition to having the usual routine entrance physical examination, including the laboratory tests common to all admissions.

This individual comes to us then with all other examinations labeled "essentially negative."

During the past three years, I have been particularly interested in the importance of history taking in these individuals as a basis for deciding on the matter of treatment, rather than placing too much dependence on local findings. It is well known that anatomic variations in the appearance of the nose, particularly as to deviations of the septum, hypertrophy of membrane, etc., are extremely common. Extensive treatment because of this or because of x-ray evidence of some slight change in the sinus lining, because the chief complaint is headache and other possible toxic factors have been reasonably ruled out, will often lead to disappointing results. I am sure that many of these cases fit into the group Dr. Johnson is discussing. If the symptomatology is

carefully investigated and the physician is not influenced too much by the anatomic variations so common and so dependent on many factors, some of these individuals are going to be saved from treatment which is not going to benefit them.

* * *

GUANIDINE INTOXICATION

R. L. WILDER, M.D.

ABSTRACT

Clinical indications of the need for determination of fundamental factors of toxemia in a variety of disorders are mentioned with special reference to the role of Guanidine.

Some of the literature on Guanidine poisoning, covering the chemical nature, possible source, method of production, with the symptoms, pathology, and chemical changes, found in experimental animals is reviewed.

Clinical evidence of the occurrence of Guanidine intoxication in man, with a short discussion of treatment, concludes the paper.

DISCUSSION

Dr. M. H. Nathanson: I am wondering whether there are any blood pressure studies made in the cases mentioned by Dr. Wilder, for the following reason: as Dr. Wilder mentioned, the clinical studies on the relation of guanidine to hypertension may not be convincing. The experimental work, however, of injecting guanidine into animals showed a very striking rise in blood pressure, so that, in addition to the gastrointestinal and neurological effects, there is certainly a blood pressure response. Also, one may expect that a substance such as guanidine should have an effect on blood pressure since substances obtained from tissue do frequently have either pressore or depressor effects.

Dr. A. E. Cardle: May I ask Dr. Wilder if there was any calcium determination made in these studies?

Dr. H. B. Dornblaser: I would like to ask if parathormone or any gland therapy was used in these experiments.

Dr. R. L. Wilder: Answering Dr. Cardle's question regarding blood calcium values, repeated blood calcium studies have been made on both experimental animals and clinical cases of hyper-guanidinemia. No decrease in blood calcium occurs.

Regarding blood pressure, measurement of blood pressure has not been recorded. In general, satisfactory standards for blood pressure in infants and young children have not been determined.

Parathormone has been used in experimental guanidine poisoning, but requires calcium in addition for satisfactory treatment. Calcium without parathormone is just as effective. Paton and Findlay have done a lot of work on guanidine in relation to tetany parathyroprivia. Other workers feel that the beneficial effect of parathormone in tetany is related to the calcium, and the occurrence of guanidine in these cases is incidental, not etiologic.

Jas. K. Anderson, M.D., *Secretary.*

Proceedings of Minnesota Academy of Medicine

Meeting of March 14, 1934

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, March 14, 1934. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the Vice-president, Dr. A. R. Hall.

There were 64 members and four guests present.

Minutes of the February meeting were read and approved.

Upon ballot the following men were elected members: Dr. Alfred Hoff (St. Paul) to Active Membership, Dr. Waltman Walters (Rochester) to Associate Membership, and Dr. Hobart Reimann to the University Membership list.

The scientific program followed.

SOME COMMENTS ON MORTALITY AND MORBIDITY TRENDS

HENRY WIREMAN COOK, M.D.
Minneapolis

Dr. Cook read his Inaugural Thesis on the above subject. This was illustrated with charts.

DISCUSSION

Dr. F. R. Wright (Minneapolis): We are what our ancestors were. You can't grow hickory or oak by planting willow or basswood. Dr. Cook's paper convinced me that the human basswood and willow multiply faster than the oak and hickory.

Dr. C. B. Wright (Minneapolis): I have enjoyed very much hearing this very well prepared paper. From the insurance standpoint it is very convincing. Practitioners of medicine, however, do not accept the conclusion of medical directors of insurance companies that small variations in blood pressure are as serious as they find. We must realize that after all the commercial pressure behind life insurance vitiates their results from the standpoint of a scientific research. The higher blood pressures are brought down to conform to their schedules and the lower blood pressures are raised for the same reason. The sales force of an insurance company exert great pressure for the acceptance of risks and the number of examinations a doctor may do has to a large extent depended on his willingness to play ball with the agent. If his financial reward had always depended on the number of applicants he rejected instead of on the number he accepted these statistics would be quite different.

In regard to the degenerative diseases, the average age of the population has increased, therefore more people

live to the age where this factor begins to play a larger part in mortality. Further, in regard to heart disease, diagnosis has very much improved in the last twenty years. Levy, in a study of 762 cases of coronary disease at the Presbyterian Hospital, New York City, in the period from 1910 to 1931, found that from 1910 to 1919 the diagnosis of coronary disease was made but seven times in 40,682 hospital admissions. In 1919, J. B. Herrick published his second paper on thrombosis of the coronary arteries. During the year 1920 the diagnosis of coronary disease was made 11 times, and, in 1931, eight patients in every 1,000 admitted were regarded as having impairment of the cardiac circulation.

Dr. H. L. Ulrich (Minneapolis): I also want to voice my appreciation of this paper. I think Dr. Wright is quite correct in his criticism of insurance statistics. They are modified by erroneous diagnoses and the pressure of salesmanship.

In regard to the increase of deaths due to cardiovascular diseases and diabetes, they are degenerative diseases and people now live long enough to have degenerative diseases. In other words, there are more people living who can die of diabetes and cardiovascular diseases. With appendicitis it is different. I have a theory which explains the increased death rate from appendicitis. The American College of Surgeons has standardized our hospitals to such an extent that behind this smoke screen of standardization the mediocre surgeon can do his bit.

Dr. Cook mentions Bacchus and nicotine as possible factors in increasing degenerative changes. I am sorry he did not mention Venus, which would lead us on to Mercury. Our good friend, Dr. Paul White of Boston, has recently pointed out that in a large group of angina cases, alcohol and tobacco users possibly suffered less from angina than the group which abstained. Alcohol and tobacco have very little to do with arteriosclerosis, and the functional effect (spasm) has been overstated.

Dr. C. B. Wright: I cannot entirely agree with Dr. Ulrich that the increased mortality in appendicitis should be laid on the doorstep of the surgeon. I am inclined to feel that medical men are more responsible than surgeons. There is a tendency to delay in these abdominal conditions for x-ray and other examinations, to definitely localize the pathology instead of being satisfied with that more indefinite diagnosis of "acute surgical abdomen" and demanding immediate operation.

Dr. E. M. Jones (St. Paul): I have been very much interested in the reports of the high mortality in appendicitis, so last year we analyzed the pathologically proven cases of appendicitis that were operated on at the Ancker Hospital from 1928 to 1932. There were 230 cases with a mortality of 9.2 per cent. These cases were taken from the combined surgical service. We found that all the cases that died came to us late. Not so many years ago we felt that too much stress was placed on appendicitis and I think the public were quite appendicitis-minded and possibly too much so; but I feel as Dr. Wright does, that appendicitis is still a very common disease and a serious one and we should always be on the lookout for it. I am of the opinion that the increased mortality is due to the delay in bringing these cases to the surgeon.

Dr. Cook (in closing): I appreciate very much the generous discussion of this paper. I would like to comment on one or two of the suggestions made. We do not get anywhere by a discussion of whether the surgeon or the medical man is at fault, because I feel sure neither is responsible for the mortality trends I mentioned. From the point of view of the medical men it is undoubtedly true that insulin is not being used early enough in diabetes. Surgeons, of course, cure appendicitis in a far larger proportion of cases than 30 or 40 years ago; but the real trouble is that appendicitis and diabetes are today so much more prevalent than a quarter of a century ago. The lesson I think we must draw from these statistics is that there is a malign influence in our civilized life today that was not present a generation ago. I think we should see that and try to solve the problem of what is the matter with modern life as contrasted with that before the Civil War, both mental, moral and spiritual. The men who commit suicide today are weaker than those who met the strains of previous generations. There is a change in character that is reflected in or coincident with physical weakness.

In regard to Dr. Wright's comments on blood pressure, I think he is entirely right in stating that physicians shade blood pressures they report to insurance companies. If an examiner thinks 145 will not get by, but 140 will, he will shade it. I think there is no question but that our statictics are modified by this, but we take that into consideration. Also the fact Dr. Wright brough out, is that more people are living to an age when these changes are operating, and we do not overlook this fundamental fact. But what I tried to emphasize is that a man of 45 today has a lessened life expectancy than a man of 45 had 40 or 50 years ago. One thousand men of 45 today will not live as long as they would have 100 years ago, and I think the medical profession should recognize this change and try to correct it.

* * *

OPERATIVE DIVISION OF THE HORSE-SHOE KIDNEY

F. E. B. FOLEY, M.D.
St. Paul

Dr. Foley's paper was illustrated with x-ray films and lantern slides. Several cases were reported.

DISCUSSION

Dr. W. F. Braasch (Rochester): I am so accustomed, on being called upon to discuss Dr. Foley's papers, to find it necessary to preface my remarks by complimenting him upon his progressive work that it is getting to be a matter of routine. His contribution this evening is again a very progressive one. Few urologists in the country have given the condition known as horseshoe kidney more study than Dr. Foley. His suggestions in regard to the treatment of pain, which seems to be caused by this anomaly, are most interesting.

We have observed some 40 fused kidneys at the Mayo Clinic; most of them were found during the last few

years because of the routine use of urography, both intravenous and retrograde, in the differential diagnosis of abdominal pain. The existence of horseshoe kidney may be surmised from either of the following data referred to the supra-umbilical area: (1) pain; (2) tumor; (3) crescent-shaped soft tissue shadow extending across the spine; or (4) one or more opaque shadows of calcification. Apparent sacculation of the renal pelvis or pyelectasis graded 1 or 2 is often observed with horseshoe kidney. In such cases the retention test or, better still, pyeloscopy might be of value in determining whether there is actual stasis in the renal pelvis. Patients with fused kidney are observed occasionally in whom pain is apparently caused by pressure on the renal pedicle or large blood vessels, which may be relieved by displacing the kidney from its anomalous position. It may be difficult in some cases to determine whether the abdominal pain complained of has its origin in the anomalous kidney. Many patients with fused kidneys have no abdominal pain or any other complaint referable to the kidney.

It is very evident that there has been a definite change in the outline of the renal pelvis shown by Dr. Foley following the plastic operation that he made. This should prove that actual obstruction of the renal pelvis existed prior to operation. The fact that the pain disappeared and has remained absent since the operation should prove the value of the proposed operation. Dr. Foley's contribution is a most interesting one and we should be on the lookout more for suitable cases in which his suggestions might be employed.

Dr. Foley (in closing): I greatly appreciate Dr. Braasch's excellent discussion of the subject. I share his view that the anomaly is not always the cause of the symptoms complained of. Accordingly, division of the isthmus is not indicated in all cases. Besides the cases I have reported tonight, we have encountered four or five other horseshoe kidneys in which it was not felt the symptoms were caused by the anomaly. In these cases nothing was done. In another case, right-sided pain was associated with stone in the right pelvis of a horseshoe kidney. The stone was removed but the isthmus was not divided. The cases I have reported speak for themselves. They all show complete relief of symptoms combined with postoperative pyelo-ureterograms scarcely to be distinguished from normal.

Dr. Braasch spoke of serial pyelo-ureterograms or pyeloscopy as a means of demonstrating retention in the pelvis. That these procedures are capable of serving this purpose there is no doubt. However, I am not so sure that all cases of obstruction producing painful symptoms will show pelvic dilatation or retention demonstrable by these means. There is much that indicates that, in horseshoe kidney, obstruction, whether accompanied by dilatation and demonstrable retention or not, is not the sole cause of painful symptoms. The cases I reported tonight all showed slight degrees of pelvic dilatation and, therefore, do not contribute much in support of this assertion.

AN UNUSUAL FORM OF RENAL POLYCYSTIC DISEASE

WM. F. BRAASCH, M.D.
Rochester

Dr. Braasch presented the kidney specimen and also showed several x-ray films.

DISCUSSION

Dr. F. E. B. Foley (St. Paul): The case which Dr. Braasch reports is a remarkably unusual and interesting one. The main question to be decided is whether or not it is a true polycystic kidney; that is, do the histologic appearance of the cysts and their relation to the kidney structure conform to what we know as congenital polycystic disease. I would like to ask Dr. Braasch what comments the pathologists and histologists at Rochester had to make in regard to these questions and whether they considered it a true polycystic kidney. Grossly, it appears to be an example of this condition.

The usual embryologic explanation of polycystic disease, while plausible, has not seemed to be entirely satisfactory and acceptable. The explanation has been that the elements of the kidney derived from the Wolffian duct, that is, ureter, pelvis and other parts of the excretary channels, fail to effect unions with the secretory elements, i. e., the glomeruli and connecting tubules derived from the renal blastema. According to this theory no excretory channels are provided for the glomeruli and as a result the cysts form. In polycystic kidney disease frequently there are similar cysts in the liver and spleen. The development of these organs is quite different from the development of the kidney and accordingly this theory fails to explain the concomitant presence of liver and spleen cysts in such cases. If this kidney which Dr. Braasch has shown is actually a polycystic kidney, it certainly further discredits this theory of polycystic disease.

Dr. Braasch (in closing): The hypothesis which Dr. Foley has advanced in regard to the congenital etiology of polycystic kidney is similar to that which Dr. White described many years ago. Among the various theories advanced is that recently given by Dr. Beeson (Beeson, Harold G.: Polycystic disease in a premature infant. Jour. Urol., 30 No. 3, 285-298, September, 1933), in which he suggests the possibility of incomplete development of the renal blastema.

If the kidney specimen which I have shown is not a polycystic kidney, what is it? Just exactly what constricted the tubules in this case so as to cause cystic changes in the glomeruli is difficult to say. It is evident that the etiologic factors must be of recent origin. It is my impression that the cystic lesion in this case is an acquired condition and not congenital.

* * *

PAPILLARY CARCINOMA OF THE KIDNEY PELVIS—A CASE REPORT

JOHN F. NOBLE, M.D.
St. Paul

This case is from the Urologic Service at the Ancker Hospital. The patient was a young man 26 years of

age, who was first seen in the Out-patient Department during the first week of March, 1934. He was admitted to the hospital March 11, 1934, complaining of attacks of hematuria, frequency, burning urination and nocturia. The frequency, burning urination, and nocturia had been present for as long as he could remember. During the three weeks prior to his admission, he had had four attacks of gross hematuria. Between these attacks his urine was clear and there was no blood in his urine at the time of admission to the hospital. He also complained of lumbar pain on the right side, which had been present intermittently for two years but which had been absent for two months before his first attack of hematuria. This pain recurred when blood was first noted in the urine.

Physical examination was negative save for tenderness on Murphy percussion over the right kidney area. I will ask Dr. Foley to show and interpret the pyelograms.

Dr. Foley: The pyelogram made at the first cystoscopy (showing film) showed a low-lying, well-filled pelvis with convex upper border exhibiting only two calyces, middle and inferior. This suggested the possibility of a duplication of the kidney and ureter, the catheter having entered the ureter going to the lower pelvis. On the basis of this interpretation it was felt the pathologic change responsible for the hematuria might be confined to the upper pole of the kidney drained by a second pelvis representing the upper half of a duplication. To bring this question to conclusion a second cystoscopy was made. The right side of the trigone was carefully searched for a second ureteral opening, without finding one. On this occasion considerably more pressure was employed on injecting the contrast medium and the injection was continued under pressure as the catheter was withdrawn in an attempt to force the medium into the bifurcation of the ureter in case of incomplete duplication. This pyelogram (showing film) shows the medium to have passed through a markedly strictured superior calyx out into the dilated pockets, as you see here. The changes were attributed either to simple stricture of the calyx with calyectasis or to "partially closed" renal tuberculosis.

Dr. Noble: The right kidney was removed by Dr. Foley, March 12, 1934. The specimen showed a fungating tumor of the pelvis involving almost the entire mucosal surface. It was firm but friable and, near the center of the kidney, it almost completely obstructed the lumen of the pelvis. The calices above the point of obstruction were dilated and this dilatation accounted for the picture obtained when the cystoscopic injection of opaque media was made under pressure. There was no gross evidence of invasion of the parenchyma of the kidney by the tumor, and the mucosa of the ureter, in that portion removed at operation, showed no evidence of tumor.

The tumor proved, microscopically, to be a papillary carcinoma. It was composed of closely packed papillomatous processes having fine connective tissue cores which carried the vascular supply of the tumor. The basilar epithelial cells were almost columnar and were overlaid by many layers of epithelial cells which tended toward a spindle shape. In certain areas, squamous type of epithelial cells were seen. Mitotic figures were frequent and the tumor showed evidence of rapid growth.

Tumors of the pelvis of the kidney are very similar to the tumors of the bladder. The benign papillomata are similar and may exist in the pelvis of the kidney for many years without any evidence of malignant change. Tumors similar to the one just reported are commonly seen in the bladder. In some instances, the epithelial tumors of the kidney pelvis may be keratonizing squamous cell carcinomas. Occasional cases of alveolar carcinoma have been reported in the kidney pelvis. The histogenesis of these tumors is not clear.

I have not had sufficient experience on which to form an opinion as to the prognosis in this case, but in all probability the tumor is as malignant, at least, as a hypernephroma. The tumors are very prone to recur by implantation in the lower ureter or bladder.

DISCUSSION

Dr. Foley: I thought this was a very interesting case and quite worth reporting. In the first place papillary tumors of the renal pelvis are relatively rare; secondly, the pyelographic findings are bizarre and instructive. I am not sure that the correct diagnosis should have been made from the pyelogram but certainly in the future I will try to take into account the possibility of papillary carcinoma of the renal pelvis when obstruction of the infundibulum of a calyx is demonstrated in the pyelogram.

As the recurrence of such neoplasms often is due to transplants in the ureter, it is planned to remove the remaining portion of the ureter and right ureteral ridge at a second operation.

Dr. A. F. Braasch: We have recently reviewed our experience with primary tumors of the renal pelvis and Dr. Cabot made a report of our data before the International Congress of Urology held in London last summer. We found that the percentage of five-year cures is very low and that the lesions must be regarded as unusually malignant. Since the tumor is very apt to have metastatic extension into the ureter and even into that portion of the bladder adjacent to the ureteral orifice, he entire ureter and adjacent bladder should be removed as advised by Judd and Hunt. I have been able to demonstrate the existence of metastases in the ureterogram in several cases. The pyelogram in this case is a most interesting one.

Dr. Noble (in closing): I think the point Dr. Braasch brought out with reference to the age of the patient is very important in considering the prognosis in this case. In the presence of malignant disease in a young individual, the prognosis should always be guarded.

* * *

The meeting adjourned.

R. T. LaVake, M.D., *Secretary.*

SOCIETIES

TENTATIVE PROGRAM

11th Annual Conference

THE MINNESOTA HOSPITAL ASSOCIATION

ROCHESTER, MINN., MAY 24 and 25, 1934

Meeting Place: Kahler Hotel

Thursday, May 24

9:00 A. M. Registration.

9:30 A. M. Opening session. Invocation. Address of Welcome—Roy Watson, General Manager, Kahler Corp., Rochester.
Resume of committee reports.
General and new business.

11:00 A. M. Round Table Conference—Mr. J. J. Drummond, Manager, Worrall Hospital, Rochester, presiding.
Subjects:
"Necessity of Greater Co-operation Between the Medical Profession, Hospitals and Other Allied Professions"—Wm. A. O'Brien, M.D., Associate Professor of Pathology, University of Minnesota, Minneapolis.
"Hospital Councils"—Mr. Victor Anderson, Manager, Abbott Hospital, Minneapolis.
"Purchase, Storage and Issuance"—Mr. Walter N. Lundahl, Glen Lake Sanatorium, Oak Terrace.
"Associated Group Purchasing"—Mr. John Sivertsen, President, Associated Hospitals and Clinics, Inc., Minneapolis.
"The Minnesota Hospital Statistical Bureau"—H. L. Dunn, M.D., Superintendent, University Hospital, Minneapolis.
Open for discussion and questions.

12:30 P. M. Luncheon.
Address—Bert W. Caldwell, M.D., Executive Secreatry, American Hospital Association, Chicago.
Presidential Address—Mr. J. G. Norby, President, Minnesota Hospital Association.

2:00-3:00 P. M. General Session—Mr. J. G. Norby, presiding.
"Admission and Discharge of Patients"—Mr. J. H. Mitchell, Manager, Colonial Hospital, Rochester.
"What Do You Know About Your Plumbing?"—Mr. George Myreck, Chief Engineer, Kahler Corp., Rochester.
Discussion.

3:00-4:00 P. M. "Patients, Hospitals and Dietitians"—Miss Mary A. Foley, Director of Dietetics, Kahler Corp., Rochester.
"The Use of Special Purpose Foods in the Hospital"—R. M. Wilder, M.D., Mayo Clinic, Rochester.
"Foods 500 People Could Not Eat"—W. C. Alvarez, M.D., Mayo Clinic, Rochester.

4:00 P. M. "Hospital Libraries"—Richard E. Scammon, M.D., Dean of Medical Science, University of Minnesota, Minneapolis.
Discussion:
M. S. Henderson, M.D., Mayo Clinic, Rochester.
Miss Helen Witherspoon, Hospital Librarian, University Hospital, Minneapolis.
Miss Perrie Jones, Supervisor of Institution Libraries, State Board of Control, St. Paul.
Tour of Mayo Clinic and Institute of Hygiene.

7:00 P. M. Banquet (informal), Mr. J. G. Norby, President, Minnesota Hospital Association, presiding.
Introduction of guests.
Address—C. W. Mayo, M.D., Mayo Clinic, Rochester.

Friday, May 25

9:30 A. M. Report of the Treasurer—Mr. A. M. Calvin, Secretary-treasurer, Minnesota Hospital Association.
Report of Auditing Committee—Mr. Ray Amberg, Chairman, Manager, Out-patient Department, University Hospital, Minneapolis.

10:00 A. M. Round Table Conference—Fred G. Carter, M.D., Superintendent, Ancker Hospital, St. Paul, presiding.
Subjects:
"A System of Central Registry for Recipients of Charity"—Fred G. Carter, M.D.
Discussion—H. L. Dunn, M.D., Superintendent, University Hospital, Minneapolis.
"Student Nursing vs. Graduate Nursing in Hospitals"—Mr. Paul Fesler, Superintendent, Wesley Memorial Hospital, Chicago.
Discussion—Sister M. Patricia, O.S.B., Superintendent, St. Mary's Hospital, Duluth.
"Pre-payment Plan of Hospital Care"—Mr. J. F. Kimball, Executive Vice-president, Baylor University, Dallas, Texas.
Discussion—S. Marx White, M.D., Minneapolis.
Discussion—Peter D. Ward, M.D., Superintendent, Miller Hospital, St. Paul.
Open discussion.

12:00 M. Luncheon.
Report of Tellers.
Report of Resolutions Committee—Rev. F. O. Hanson, D.D., Superintendent, Swedish Hospital, Minneapolis.
Address: "China"—Walter Judd, M.D., Mayo Foundation, Rochester.

GENERAL SESSION

2:00-3:00 P. M. "Hazards in Extending Tax Supported Hospitalization"—Mr. J. P. McDonnell, President, Minnesota Taxpayers' Association, St. Paul.
Discussion—C. E. Remy, M.D., Superintendent, Minneapolis General Hospital, Minneapolis.
Discussion—Mr. A. G. Stasel, Superintendent, Eitel Hospital, Minneapolis.
Discussion—George Earl, M.D., St. Paul.
Open discussion.

3:00-4:30 P. M. Sanitarium Section—A. T. Laird, M.D., Medical Superintendent, Nopeming Sanatorium, Nopeming, Minn., presiding.

"The Psychiatric Department in a General Hospital"—J. C. Michael, M.D., Minneapolis.
Discussion—L. R. Gowan, M.D., Duluth.
"The Problem of the Epileptic"—D. E. McBroom, M.D., Superintendent, State Colony of Epileptics, Cambridge.
Discussion—G. R. Kamman, M.D., St. Paul.
"The Treatment of Tuberculosis"—W. D. Beadle, M.D., Superintendent, Mineral Springs Sanatorium, Cannon Falls.
Discussion—F. L. Jennings, M.D., Oak Terrace.
"The Functions of a Mental Hospital"—George H. Freeman, M.D., Superintendent, State Hospital, St. Peter.
Discussion—Oscar C. Heyerdale, M.D., Superintendent, State Hospital, Rochester.

5:00 P. M. Installation of officers.
Adjournment.

5:00-5:30 P. M. Special Carillion Recital on Rochester Carillion complimenting visiting members of Minnesota Hospital Association by Mr. J. J. Drummond, Manager, Worrall Hospital, Rochester.

Saturday, May 26

Golf tournament.

NEWS ITEMS

Dr. G. E. Van Demark, Sioux Falls, was the guest speaker last month, before the members of the Vermillion Medical Society.

Dr. L. J. Leonard, Minneapolis, has been admitted to practice law in Minnesota, having recently received his law diploma.

Dr. Harry P. Ritchie, St. Paul, was the guest speaker at a meeting of the members of the Childrens Hospital Association of that city last month.

Dr. G. E. Countryman, one of the leading physicians and public spirited citizens of Aberdeen, died last month after an illness of nearly a year.

Dr. A. F. Toohey, physician and surgeon, who has practiced at Beresford, S. D. for over thirty years, passed away last month at the age of 60 years.

The District Medical Society held their April meeting at Madison, S. D., and were favored with an admiral address by Dr. Harold Swanberg of Quincy, Ill.

A large attendance of the medical men was held at Crookston, Minn., last month, with Dr. W. S. Judd, Rochester, presenting a paper on "Chinese Medicine, Ancient and Modern."

Dr. L. E. Evans, formerly in practice at Alexandria, Minn., died suddenly last month in California. Dr. Evans was 65 years of age and his early work was at the Mayo Clinic, Rochester.

The annual meeting of the Graduate Nurses of South Dakota, will be held at Watertown, May 15-18. Two days will be devoted to business and demonstrations along nursing and public health lines.

Dr. E. T. Bell, of the University of Minnesota was the leading speaker at the last monthly meeting of the members of the Northwest Medical Society at Minot. Dr. Bell presented a paper on "Nephritis."

The members of the Minnesota Academy of Medicine enjoyed a fine dinner and two papers followed, "The Doctor in Fiction," Dr. Harold E. Hullsiek, and "Pulmonary Carcinoma" Dr. F. F. Callahan, at their May meeting.

Dr. L. R. White of the United States public health service, has been named medical director for the Indian service, for Minnesota, Wisconsin, Michigan, Iowa and North and South Dakota, with headquarters at Minneapolis.

Dr. and Mrs. Andrew Carr, Minot, N. D., celebrated their golden anniversary last month at their home in that city. Dr. Carr is well known in all sections of North Dakota, and is one of the past presidents of the State Medical Association.

The members of the Grand Forks Medical Society were honored with an address at their last meeting by Dr. A. R. Luckhardt, Chicago, who spoke on "The History of Our Knowledge of Digestion." Dr. M. B. Ruud, president of the society presided.

At the April meeting of the District Medical Society held at Dawson, Minn., two interesting papers were presented, both by Minneapolis physicians, Dr. Myron O. Henry, topic being, "Fractures" and Dr. T. W. Weum, a paper on "Obstetrical Problems."

Dr. J. A. Myers, Minneapolis, was the principle speaker on April 17 and 18 at Birmingham, Alabama. Dr. Myers addressed the three Alabama societies, Tuberculosis Association, State Medical Association and Pediatric Society. All of the meetings were largely attended.

Among the interesting exhibits to be prepared for the annual meeting of the Minesota State Medical Association to be held at Duluth, July 16-18 will be a complete exhibit on tularemia, a serious infectious malady spread from disabled rabbits, squirrels and foxes and often carried by ticks and horse flies.

Mrs. William J. Byrnes, Minneapolis, who organized the first auxiliary to a medical society in the United States, was recently honored with an informal dinner tendered by the members of the Hennepin County Medical Society and its Auxiliary. Mrs. Byrnes was presented with the first past presidents jewel ever awarded, in recognition of the time and good work she has given the auxiliary.

The regular spring meeting of the Yankton District Medical Society was held at Vermillion, S. D., April 19, with a good attendance of both the physicians and the Ladies' Auxiliary. There was the usual dinner followed by the scientific program as follows: Clinical Review: "Carcinoma of the Sigmoid," "Carcinoma of the Cervix," "Gunshot Wounds of the Abdomen," Dr. S. M. Hohf, Yankton; "Cyclic Vomiting in Childhood," Dr. F. A. Moore, Yankton; "Thymoma," Dr. F. J. Abts, Yankton; "Pathology," Dr. J. C. Ohlmacher, Vermillion; "Back Injuries," Dr. G. E. VanDemark, Sioux Falls.

At the regular meeting of the Hennepin County Medical Society on Monday evening, May 7, the results of the election were announced as follows: President, Dr. J. M. Hayes; first vice-president, Dr. W. H. Aurand; second vice president, Dr. J. H. Simons; executive committee, Dr. Moses Barron, Dr. Gilbert Cottam; board of censors, Dr. W. E. Camp, Dr. C. R. Drake; board of trustees, Dr. A. S. Hamilton, Dr. E. W. Hansen; ethics committee, Dr. Oscar Owre, Dr. C. A. Stewart; delegates to state convention, Dr. C. A. Stewart, Dr. D. P. Head, Dr. E. K. Green, Dr. E. S. Platou. All newly elected officers will take office in October.

The attention of medical men throughout Minnesota is called to the fact that the State Medical Association Committee on Education and Hospitals, in cooperation with the General Extension Division of the University of Minnesota, and a faculty committee from the Medical School, has just issued a new bulletin announcing post-graduate lectures and clinics now available for county medical societies and similar organizations of physicians. The list has been thoroughly reorganized and revised, and the topics include a very widefield of study and discussion. The plan is to send out specialists in the different fields for series of from four to eight or ten lectures, coming once a week or twice a month during the season. Different men will come for each meeting and thus an interesting range of subjects will be included. Interested physicians are invited to write to the General Extension Division, University of Minnesota, for a copy of this new bulletin.

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The JOURNAL LANCET

Minneapolis, Minnesota
June 1, 1934

New Series
Vol. LIV, No. 11

Surgery in Diabetes*

Carnot H. Sherman, A.B., M.D., M.Sc. (Med.)
Oakes, N. D.

Incidence

DIABETIC patients no longer need be deprived of the benefits to be derived from surgery. Formerly, the surgeon only operated upon these patients under compulsion, but now he can do so with as much safety as in the non-diabetic. He can operate on patients needing elective surgery, as repairs of various types, chronic infective conditions, malignancy and even cosmetic surgery as evidenced by reports from various medical centers and groups. Thus at the Massachusetts General Hospital, Fitz found 45 operations in the four years preceding 1918. In the succeeding five years ending in 1922, Young found 99 surgical cases. In contrast to this, McKittrick and Root report from the New England Deaconess Hospital for the year 1927, 113 operations or 10 per cent of the total diabetic admissions.

The increased number of operations is due to the greater frequency of periodic health examinations uncovering earlier and milder cases which lend themselves better to operations; to treatment which results in cases of longer duration and hence more opportunity for conditions to arise making operation imperative; but most important, to the advent of insulin which has made it possible to carry the operative patient thru with greater safety.

McKittrick and Root give the present ratio of patients needing operation whether operated upon or not as 1:3. But owing to the prolongation of life of the diabetic, that ratio may change to 1:2.

Radical changes in treatment and prolongation of life have changed the causes of death in diabetes. Formerly, 51 per cent died of coma and only 9.8 per cent died of surgical diseases. Recently from 33 to over 50 per cent die of surgical causes.

The pathology of diabetes will not be discussed in full in this thesis. For the most comprehensive description the reader is referred to Warren's "The Pathology of Diabetes Mellitus."

The Diabetic as a Surgical Risk

General considerations. Sixty per cent of the cases of diabetes develop after 40 years of age and 25 per cent between the ages of 20 and 40 years. Hence, the majority of patients will need surgery at a time when their fitness for it otherwise is not at its best. Eighty-five per cent are above weight due to habits of life which make them a poorer risk as a class. Cardiovascular disease is common. The local and general resistance in diabetes is reduced as shown by their susceptibility to infections. Increased concentration of sugar in the tissues, ketosis, hyperglycemia, arteriosclerosis, and malnutrition have each

*Thesis submitted to the Faculty of Surgery of the Graduate School of Medicine of the University of Pennsylvania in partial fulfillment of the requirements for the degree of Master of Medical Science (M.Sc.[Med.]) for graduate work in Surgery.

been considered as the cause of the lowered resistance, but no one factor is entirely responsible as each plays a part.

The individual case. The surgical risk of a given diabetic patient will depend upon:

1. Complications present.

(a) Hyperglycemia. In general, the higher the blood sugar, the graver the surgical risk. If above 350 mgms. per 100 c.c. of blood either acidosis or severe infection is present.

(b) Glycosuria. This is usually present, but its presence is dependent in many cases upon the renal threshhold and its absence does not mean that the patient is not a severe diabetic. A high glycosuria usually means a high hyperglycemia; hence, severe diabetes. However, in children, the urine may contain five per cent with a low hyperglycemia which means diabetes of a mild degree. The urinalysis should not be used as an index of the severity of the disease.

(c) Hypoglycemia. Emaciated and weak surgical patients must be watched for hypoglycemia which may occur either with or without insulin when a sudden improvement in the surgical condition lessens the amount previously necessary. This suggests the necessity for frequent blood sugar determinations during post-operative or non-operative care. Unusual exercise and diarrhea may also cause hypoglycemia.

(d) Acidosis. The risk of operation during acidosis is very materially increased. Its development is insidious, easily overlooked, and apt to occur during the course of a surgical condition. The ferric chloride test gives an indication of it, but the CO_2 combining power of the blood is the most trustworthy index of its severity. Emergency operations may be undertaken but the seriousness of them must be recognized. The procedure of the operation or complicating infection may induce coma promptly.

2. Hazards peculiar to abnormal metabolism. If the theory of non-utilization of glucose be accepted the diabetic is unable to utilize carbohydrate properly, and the products of incomplete combustion result in acidosis. In other words, according to this theory, fat can only burn in the fire of carbohydrates. Inability to store carbohydrate results in hyperglycemia with glycosuria and wasting of food and body tissue.

The tendency to acidosis and coma is intensified by (1) hyperthyroidism, (2) infection and (3) overfeeding. Hyperthyroidism mobilizes the glycogen from its body storage producing hypoglycemia which may become dangerously low and be aggravated further. The depletion of glycogen causes excessive formation of ketone bodies and acidosis results. The surgical risk in the diabetic is increased by hyperthyroidism and is further accentuated by infection. Overfeeding, especially with protein and fat increases the danger of acidosis. A decreased metabolic rate, usually the result of inanition, increases the diabetic's risk. Any patient with a marked loss of weight is a poor surgical risk because resistance for infection is lowered and hypoglycemia is impending. Coma may occur when least expected.

3. The judicious use of insulin converts a poor into a good operative risk by storing glycogen in the liver and muscles, and thereby protecting against acidosis during and after operation. Insulin has no direct influence on infections and must not be relied upon by itself. Proper surgical measures must never be neglected.

4. Pathology. The surgical hazard is influenced by pathology exclusive of the surgical lesions. Arteriosclerosis is usually present after 30 years of age. Coronary disease is frequent. The kidneys show chronic changes in a large percentage of cases. Infection, a frequent complication, increases the gravity of the prognosis.

Differential Diagnosis of Surgical Disease and Diabetic Coma

Confusion between diabetic coma and a surgical condition is very frequent. Many times they occur concurrently because acidosis is precipitated very frequently by a beginning infection.

Coma is characterized by "air hunger" or Kussmaul type of respiration, hyperglycemia, glycosuria, acetonemia and acetonuria. The onset is usually insidious. For a week the patient may have anorexia, headache, abdominal cramps, weakness, nausea, vomiting, constipation and dyspnoea. Pain may occur in almost any part of the body but in the abdomen most commonly, suggesting a surgical disease of an organ in the region of distress as ruptured gastric or duodenal ulcer, pancreatitis or acute gallbladder disease in the upper part of the abdomen. In the lower part it may be mistaken for appendicitis, pelvis disease or a genito-urinary lesion. The pain in acidosis, however, is usually indefinite in character and location. Constipation may be severe. The bladder may be distended. The blood pressure falls. Acetone odor of the breath may be noted. The carbon dioxide combining power is usally below 20 volumes per cent, but it may be higher due to the administration of alkalie.

The temperature in a diabetic may be misleading because it is usually lower than in a non-diabetic for the same amount of sepsis. Fever means a complication and not acidosis. In uncomplicated diabetic coma, the body temperature is usually

subnormal. Leucocytosis may be present in acidosis. Again the leucocytes in the diabetic do not rise in proportion to the degree of infection as they do in the non-diabetic.

In a case of coma the following conditions must be differentiated: acidosis, hypoglycemia, alkalosis, onset of an acute infection, septicemia, meningitis, encephalitis, uremia, cerebral hemorrhage, brain tumor, epilepsy, narcotic poisoning and trauma with concussion or compression of the brain.

Differential Diagnosis of Surgical Conditions in Diabetes

Diagnosis presents problems peculiar to the diabetic. First, the symptoms are less definite and second, the rapid progress of devastating effects of the disease in a diabetic makes an immediate diagnosis imperative.

The following points in making a diagnosis are helpful: (1) A careful history, as to previous pain or similar attacks. (2) Character of pain, if definite or indefinite, remembering that pain is less severe in a diabetic but of the same character as in a non-diabetic. (3) Nausea and vomiting usually follow pain in an intra-abdominal emergency. (4) Localized tenderness with muscle rigidity over the suspected region is the most reliable sign of an inflammatory lesion. (5) A logical relation between temperature, pulse, white cell count, history and physical findings suggests a surgical condition.

To repeat, an immediate diagnosis is imperative in order to institute proper treatment at once. In gall bladder disease and acute appendicitis, there is much less pain and fever but empyema with gangrene of the gall bladder and gangrene of the appendix progress much more rapidly and the lesion reaches a hopeless stage much sooner than in the average non-diabetic patient with the same lesion. Lowered resistance in the diabetic does not permit procrastination. In either of the above conditions it is better to operate unnecessarily than to delay too long.

Treatment

Pre-Operative—Elective cases. A preparatory period of a few days to a few months may be advisable in order to standardize the patient; to build up gycogen storage to prevent acidosis; to increase nutrition; to reduce the danger of infection; to allow the patient to recover from any concommitant infections; and possibly to wait in order to build up morale.

The following method is used for standardizing a diabetic diet at the Petty Clinic of the Graduate Hospital of the University of Pennsylvania. Adults receive one gram and children two to three grams of protein per kilo of standard normal weight. By standard normal weight is meant the normal weight for that particular patient's age and height. They are allowed 80 to 120 grams of carbohydrate, depending on the age and size. The older and larger individuals are given amounts approaching the eighty gram limit. If a patient is much underweight or is a young individual the amount of carbohydrate approaches the 120 gram limit. The balance of the caloric need is in the form of fat.

The caloric requirement for the average hospital patient per kilo normal standard weight is thirty calories for the adult and from sixty to eighty calories for a child.

A large amount of carbohydrate necessitating larger insulin dosage is in line with the modern methods of treatment. The larger doses are as suitable to give as the smaller; the patient is much easier to control and is less apt to cheat. Joslin, in 1923, gave an average of 71 grams daily of carbohydrate, while in 1921 he allowed an average of 125 grams. McKittrick and Root feel this change lessens the tendency toward arteriosclerosis. One unit of insulin is used for every 20 mgms. glucose per 100 cc. above the normal limit. That is, one unit of insulin reduces blood sugar 20 mgms.

Emergency cases with impending coma. In the Petty Clinic, hot blankets are on hand at all times and the patient is immediately placed between them. Hot water bottles are not used for fear of burning the patient. A cleansing enema is given. Urine obtained by voiding or by catheterization is examined for sugar, acetone and diacetic acid. The amount of sugar and CO_2 combining power of the blood is determined. Three liters of normal saline or other fluids are administered daily subcutaneously or intravenously. Experience shows that alkalosis is not produced by sodium bicarbonate as the acetone bodies are oxidized by the action of insulin. One gram of sodium bicarbonate per 80 pounds body weight raises the CO_2 combining power of the blood one volume per cent and 20 grams given within a few hours is safe. Fifty units of insulin are injected and blood sugar is determined every two hours. An average of 200 units are prescribed in six to eight hours or enough to reduce the blood sugar to normal. If alkalies and insulin do not raise the CO_2 combining power of the blood or lower the blood sugar sufficiently, the intravenous administration of glucose will accomplish the desired result.

In an emergency, the sugar need not be reduced but proper treatment with glucose and insulin just prior to operation should be carried out. In neces-

sity, operation may be performed in coma successfully.

In operations of election the standardized diet is given on the night before operation. These patients must not be starved. On the afternoon of the day before operation, a Jutte tube is passed into the duodenum and is left in place during and for several days after operation. This permits taking the required carbohydrate and fluids without nausea or vomiting and obviates the inconvenience to patient and medical attendant of giving subcutaneous and intravenous injections.

On the morning of operation, the carbohydrate portion of the standardized diet in the form of lactose is given through the tube. Glucose produces more gas than lactose and is objectionable because of distention after operation. The required amount of insulin is given hypodermically. No treatment for diabetes is necessary during operation.

Post-Operative—After operation the procedure is the same. The noon and evening requirements of carbohydrate and liquids is given through the tube and the computed amount of insulin hypodermically.

Four to five hours after operation the blood sugar and CO_2 combining power are determined and followed by appropriate treatment. Thereafter these determinations are made daily. The above method of feeding is carried out through the Jutte tube which is left in place until the danger of vomiting has passed. After that, the diet is ordered in accordance with surgical requirements but maintaining the standard previously worked out. Patients with coronary disease do best if the blood sugar is kept around 160 mgms. per 100 cc. blood.

There is one point in the care of diabetics as well as non-diabetics that is well to note. Forty to fifty per cent of protein in the form of uncooked white of egg unless beaten very light is not utilized. Decomposition of the unused portion is likely to cause a gastro-intestinal upset.

Choice of an Anesthetic in Diabetes

Ethylene—According to McKittrick and Root, ethylene has the following advantages. When properly given asphyxia is not produced and respiration is not affected, hence there is no increased blowing off of CO_2 which might produce acidosis. The respiratory tract is not irritated by ethylene. The liver is not injured hence glycogen storage is not disturbed. The kidneys are able to perform the normal function of producing ammonia which is utilized as a base for combining with the acid radicals of the blood and prevents the necessity of calling upon other reserve bases and depleting them. This depletion or lowered alkalic reserve is equivalent to a low CO_2 combining power and this in turn is equivalent to acidosis. The blood sugar is not raised to such an extent as in ether anesthesia. There is no change in the non-protein nitrogenous constituents of the blood. Coagulation and bleeding time are not altered. Ethylene gives relaxation better than nitrous oxide, but not so good as ether. There is much less sweating which leaves the patient in better condition. There is less vomiting which is a factor in producing acidosis. The disadvantages of ethylene are its inflammability and its smaller margin of safety in overdose. It requires greater skill in its administration.

Nitrous oxide has about the same advantages as ethylene, is not so dangerous as an explosive and has a greater margin of safety. It does not give sufficient relaxation in abdominal operations and may require a dangerous degree of anoxemia.

Ether produces acidosis in a diabetic in proportion to the length of operation and severity of diabetes. The alkalic reserve falls, renal excretion is lessened and ammonia production is interfered with. Carbohydrate and fat metabolism is altered. Hyperglycemia is produced by interfering with the production of insulin. The conversion of glycogen into glucose by injury of the liver cells by anoxemia may be a factor in producing hyperglycemia. Acidosis is frequent a day or two after operation. Nausea and vomiting after ether anesthesia tend to produce acidosis.

The advantages of ether are the greater margin of safety in overdose, less skill required in giving it, and better relaxation in abdominal operations.

Spinal anesthesia seems to be gaining in popularity by surgeons, although the majority fear it. From the standpoint of altering body chemistry it is almost ideal. Acidosis is rare. Food can be taken immediately, whereas in general anesthesia the Jutte tube needs to be used. Nausea and vomiting during operation under spinal anesthesia is very common.

McKittrick and Root state that it is doubtful if an incision can be made above the umbilicus under spinal anesthesia but on the Lee surgical service at the Graduate Hospital of the University of Pennsylvania, 300 mgms. of neocaine is given routinely between the second and third lumbar vertebra for upper abdominal operations which are done very satisfactorily. The fall in blood pressure during spinal anesthesia is alarming to the inexperienced but if the head is kept low it does not result fatally. To combat the low pressure adrenalin or ephedrine should be used before and during anesthesia.

(*Continued in the June 15 Issue*)

Mental Hygiene Problems In a University*

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THE opinions of psychiatrists are often under suspicion. This situation arises not so much because their views may seem to be out of harmony with the judgment and reasoning of the average man of intelligence, but because they point out some very obvious truths, arrived at through a study of maladjusted personalities, or neurotic people. That these truths should be applicable to the normals, raises a question which can be answered by reference to the most fundamental facts of psychology. No one would deny that each of us has within his personality all of the elements which go to make up the symptomatology of the neuroses or the psychoses. The difference is one of degree. Study of the maladjusted, then, is merely the reading of normal traits projected and enormously enlarged on the screen of neurotic behavior. We as psychiatrists can observe those persons who are fighting emotional battles or those who have lost the fight and pass along some of the lessons learned to normal people who have need for guidance.

The necessity for a college or university Mental Hygiene program is so evident that it need scarcely be mentioned. Yet I want to correlate some of the scattered points to emphasize the immediate need for some workable scheme. The college student is intellectually top heavy, and therefore in a precarious situation. For fifteen or more years he has been told that the acquisition of knowledge constitutes education and he has pursued this academic ideal. Little of that knowledge is actually helpful or applicable to life's real problems. The things are neglected which might assist the student to use the knowledge which he has acquired. The goal of our educational scheme is the training of intellect. It would be much healthier to see the goal of education as the *personality*. Potentiality for success is obviously not determined by sheer intellect for all of us know men with good minds which they are unable to use. The possibilities for success are almost wholly determined by the qualities of the personality.

The stability of the personality is the best index to the resources of the school and college through which the individual has passed. I believe it is possible for the college to determine whether the course of the student is toward a mental hospital or toward success in life. Many would remind me that when the student arrives at college the die is cast—the college must train the material it has—it cannot first mould that substance into a well-balanced whole and then apply the process of intellectual cultivation. The answer is to be found in the records of any college mental hygiene service. The remarkable fact is that so frequently minute readjustments seem to release the personality and change the life pattern. I could cite examples of a single interview switching the course of a student from a destructive to a constructive tread.

Dr. Bond,[1] director of the Institute for Mental Hygiene in Philadelphia, made the following remarks in an address to the graduating class of one of our best eastern colleges: "The intellectual training of the artist, his technique, can be graded and passed. The diploma ready for you on this platform guarantees your success—in an Arcadia; it is seldom that intellectual ability and skill ever fail any one, once they have been present and tested. But to how many of you, to how many people in the world, can we give a diploma which will certify that they are emotionally grown-up and entitled to the privileges of independent people? Not to the jealous, the envious, the suspicious, for these people haven't passed third-grade requirements. Not to chronic worriers or drinkers. Not to the selfish and disagreeable. Not to the graduate of any school who cannot eat a meal unless it is cooked by her mother. Not to John Ruskin, who at fifty-two was ruled by his mother, who had previously accompanied him to college and chosen a wife for him. Perhaps to Benjamin Franklin. Certainly to some college graduates who have taken special courses in a sanitarium, finding out, for instance, that it isn't wrong to be happy, or that it is well to establish some regular habits from which imagination can take flight and on which it can find a landing place, or to develop a capacity for independent and unprejudiced actions."

Nothing could emphasize the fact that colleges are failing in their training of an adequate per-

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*Read before the fourteenth annual meeting of the American Student Health Association, Chicago, December 29, 1933.

sonality more strongly than to examine data submitted from the industrial world. Academic facts and psychological theories are apt to be regarded as empty talk, but this same information presented in terms of dollars and cents, jobs, failures in industry, forced resignations, etc., will not be disregarded.

Doctors Anderson and Kennedy,[2] whose work in industrial psychistry and psychology qualify them to speak with authority, tell us that a personnel representative of a well-known industrial organization chose from the seniors in colleges along the eastern seaboard 344 prospects. Psychological and psychiatric examination eliminated all but two of this group from consideration as possibilities for executive positions or training. Thirty were acceptable for minor positions. This means that only nine per cent of a chosen group were considered fit in every category for employment in this particular organization.

Another check-up was made from another angle. Of 646 college graduates accepted for responsible positions, over a period of eleven years, 190 were definitely unsuccessful. This represents 30 per cent of a group originally picked as promising material. This does not include men who resigned nor an additional 20 per cent who were never promoted from their original positions.

The failures were not due to inferior intelligence, poor health, or lack of college training, but were due to deep-seated character traits, qualities of the personality that a careful psychiatric examination could have detected and which if attacked early in the college career might have yielded to attempts at mental hygiene, re-education or readjustment.

Some light is shed on the magnitude of the problem of mental hygiene by psychiatrists who have dealt with college problems. Dr. Blanton[3] studied 1,000 unselected juniors and seniors at the University of Wisconsin. His results indicated that more than 10 per cent of the students suffered from emotional disturbances "sufficient to warp their lives and in some cases cause mental breakdown unless properly treated." Dr. Cobb[4] of Harvard examined all incoming freshmen from a psychiatric standpoint and found more than 16 per cent in danger of becoming victims of neuroses if not actual mental disease. Doctors Morrison and Diehl[5] at the University of Minnesota found 18 per cent of 1,300 freshmen affected by emotional disturbances serious enough to warrant mental hygiene supervision and treatment.

Dr. Angell[6] states that only 14.4 per cent of students possess a good life adjustment. How this compares with the general run of population, I cannot say, but the very fact that Dr. Angell regards 86 per cent of the people he studied as being emotionally maladjusted is startling. Doctor Pressey[7] studied one hundred women at Ohio University and reports 88 per cent with at least one problem which could be considered serious from the standpoint of mental integrity.

Dr. Frankwood Williams,[8] in an address before this Association in 1920, stated: "A larger number of students than is supposed develop, as a result of their experience and its neglect, frank mental disease (insanities); others stumble out of the schools only to be picked up and tended a few years later. A very much larger number develop crippling and incapacitating neuroses. Scattered between the two extremes, however—those who successfully find their way through and those who develop frank illness—comes the large body of students, each with his own particular warp. Some are very considerably warped and will recruit the world's supply of college-graduate failures and mediocrities."

It would seem then that from mental hygiene investigations conducted in a number of widely separated colleges, about 85 per cent of students show some need for help in integrating their emotional lives. Ten to fifteen per cent are in actual danger of mental breakdowns.

No doubt some student health organizations think abstractly about mental hygiene but hesitate to enter into so vague, so intangible a problem as the management of emotional disorders. A justifiable reason, perhaps, is that even though for fourteen years it has received wide attention, nothing really tangible seems to be generally known of mental hygiene, what it is, how it works, who does it, etc. The answer is that every university health service, since its establishment, every personnel officer, the faculty adviser, the college chaplain, the coaches, all have been performing the functions of mental hygiene. There may be some persons today who regard the turmoil and conflicts of the student as academic matters and not material for the psychiatrist. There are, however, numerous advantages in turning these problems over to a man trained in mental hygiene: (1) The psychiatrist has cultivated and attained an objective point of view. His personal opinions or prejudices do not enter into the situation. (2) Will power and intellectual control are not given much credit by the psychiatrist. Decisions and behavior, particularly in persons under stress, are emotional, not intellectual phenomena. (3) What the student may say, how he reacts, the symptoms he presents are not

acceptable to the psychiatrist at face value. The mechanism of conversion of psychic conflicts into symbols of totally different character is universally seen. The surface is scraped off and the real motivation exposed. (4) To the average academic mind mental ill health has meant mental deficiency, of which there is surely none in college, or insanity, which is indeed rarely observed. Mental hygiene, however, concerns itself chiefly with the recognition and re-education of a vast number of persons belonging to neither of these groups but whose lives are even more pitifully cramped by the very fact that their intellectual capacities and emotional lives are so grossly disproportionate.

In the large sense, Dr. Edward A. Strecker[9] says: "Mental hygiene may be defined as an effort to strengthen and discipline the mind, a cultivation of its constructive potentialities so that they may be developed into helpful realities. The objective is the greater happiness of the individual and its larger and ultimate goal the mental or spiritual betterment and evolution of the race. In a more restricted sense, the purpose is to free the individual from blind conflicts that are disturbing him, and allow him to be free to apply himself to the problems at hand. It should be a great step toward the prevention of possible mental illness, emotional incapacity and a social conduct."

At the University of Pennsylvania, I have seen during the last twelve months more than one hundred students for an average of three visits. Fully 90 per cent were experiencing emotional crises sufficient to warrant careful management by a psychiatrist. Not more than 20 per cent actually resigned or received leave of absence for the purpose of treatment and rehabilitation. The rest made an adjustment of one sort or another which might temporarily relieve the situation. Thirteen per cent were definitely classifiable as mentally sick or insane. It is an interesting fact that not even all of these left college. Several continued to attend classes until they were rushed off to a mental hospital by police for some overt behavior off the campus or until the parents could be convinced that an emergency existed.

I persume every college psychiatrist would agree with me that the largest number of cases coming to his attention belongs to no well-defined psychiatric classification. For the purpose of presenting the material as concretely as possible, however, I will call this largest group "anxiety states." To an enormous number of college students the freshman year stands out as a crisis. The step from school to college has always been regarded by him as the final attainment of independence and idealistic motives fairly bristle from him. Decisions are to be his, square shooting and fair play are to be his forte, motives are clear cut and nothing is left but to drive on to success. His school record is beyond criticism, his family solicitude for a creditable showing is tolerated but unwarranted. Things, however, do not go so smoothly. One finds it hard to get acquainted, the university is such a seething place, cramming does not seem to do the trick scholastically, religous doubts seem to be about him, moral standards are not what he had always thought, one must drink if one is to "be in" with a certain group, mixed up in the whole situation are sex problems for which he is not prepared. Gradually his feeling of security is being threatened and he casts about for something stable to cling to. People are getting the wrong impression of him, he feels self-conscious and embarassed, academic records show him far down in the list when he has always been at the top. Something is wrong—he is not hitting on eight cylinders. Anxiety and apprehension assail him and there is no place to turn. Perhaps his mind is "shot," burned out, he may be getting a little queer. He approaches his professor who seems a little bored and who tells him to snap out of it, to take long walks, mingle with the fellows. But this is no help. If this situation continues some protective mechanism is likely to come to the rescue, he projects has emotional distress onto "unfair" professors, or compensates by shows of physical strength and pugnacity, or turns to alcohol as a pleasant sedative, or invents some physical ailment which satisfactorily accounts for all of the difficulty and stands ready as an alibi should he fall by the wayside.

I suppose no group is more satisfactory to deal with from the mental hygiene standpoint than these minor anxiety states and frequently two or three interviews are sufficient to re-orient the student and set him on the right path.

The second greatest number of cases seen in the mental hygiene department to date fall into the group of affective disorders or manic-depressive reaction types. It seems quite reasonable that this should be the case since during the depressive phase the individual is slowed up, retarded, ability to concentrate and to retain academic material is impaired, the student is puzzled, suffers from feeling of failure and inadequacy, usually is struggling with insommia and is driven by his own feeling of reduced efficiency and concern *or* directed by some interested teacher who had recognized the rapid decline of mental acuity to seek

medical advice. In the state of exhilaration, on the other hand, curricular activities are boring, too restricting, the student needs room to expand and after a brief period of academic efficiency the work is allowed to slide in favor of more ambitious schemes and he is referred to us either as a disciplinary measure or because the instructor has sensed the presence of pathologic pressure.

The group of pathologically introverted or schizoid types appears third in frequency, probably because many of them have been sorted out before college age is reached. Perhaps it is because this type is so frequently retiring, shy, and unnoticed that relatively few reach the college psychiatrist. On the other hand, the studious, shut-in is likely to be pointed out as the ideal student whose academic interests and ideals leave no room for frivolous social life. I have three times in the past year had the unhappy experience of carrying the news of successful graduation to people whose academic careers were climaxed by commitment to mental institutions. I have two students at the present time pursuing graduate studies leading to a doctorate whose only possible outcome will be lengthy if not permanent residence in a psychopathic hospital.

Hypochondriacal types, conversion hysterics, and neurasthenics make up a large proportion of our cases. All of these people have come to us by way of the medical or surgical department. Physical symptoms have supplied compromises for many caught up in emotional conflicts. Fatigue states or "nervous exhaustion" are encountered rather frequently but is extremely rare that actual mental or physical overwork can be held to account. More often the fatiguing nature of continuous emotional tension attendant upon some more deeply lying personal maladjustment is to blame.

Every year we, in common with every other student health service, have a certain number of phobias and obsessional neuroses to deal with. Compulsory swimming brings to light a fair number of men and women whose fear of water amounts to actual inability to get into the pool and some would prefer withdrawing from school to risking a few swimming lessons. At the University of Pennsylvania we have issued the same excuse from the class as we would for physical incapacity. Attempts to eradicate this phobia are made through psychotherapy and by management as carefully controlled as that involving cardiac or other organic disease.

Homosexuality in the schools and colleges has received an increasing amount of attention in the past ten years. I venture to think that it is not so common in coeducational schools but it makes up a considerable problem in every educational organization. Comparatively a very small percentage of homosexuals ever reach the psychiatric clinic but those who do test the skill of the physician to a marked degree. We have tried to differentiate between what have been called the "biological homosexuals" and the so-called "acquired" types. Neither is amenable to treatment by any technique known to us. The aggressive types usually withdraw from school after the true situation is recognized. This whole question of homosexuality in schools and colleges requires a great deal of careful thought and painstaking investigation. At the present time we feel our knowledge inadequate and would welcome any contribution which would offer clues as to an encouraging therapeutic approach.

Glandular dysfunctions scarcely ever fail to involve the emotional balance of the individual and a considerable part of our therapeutic endeavor is focused upon this point. Encouraging results have been obtained particularly in the mild hypothyroid types.

Neurological conditions are relatively rare but we have accumulated nine cases of narcolepsy in the past twelve months. As a result of our experience with this syndrome in college students, our views regarding it have been modified. We hope in the near future to elaborate this statement in a publication which deals with the psychogenic basis of the condition. Nevertheless, the now classical ephedrine treatment brings about symptomatic relief.

Behavior problems or disciplinary cases are only occasionally referred to the mental hygiene clinic at the present time. We hope to see the time when all students coming before the disciplinary committee pass first through the hands of the psychiatrist. An encouraging feature of this aspect of the University life is that our recommendations have invariably been accepted and followed to the letter.

Dr. Edward A. Strecker, professor of psychiatry at the University of Pennsylvania, is now formulating an extensive program of investigation into the personality problems existing among medical students. The work will in a sense parallel Opie's work on the relation of the life led by the student to the incidence of tuberculosis. One aspect of the study is to be the determination of the effects of strain of the student's medical experiences on the personality.

The specific program which I feel would be an immediate ideal for a university mental hy-

giene organization would be somewhat as follows:

The psychiatrist, situated in the Student Health Service, should be responsible for the spread of mental hygiene propaganda among the faculty. This could best be accomplished by lectures given by well-known educators and physicians on the significance of student mental health problems in relation to the whole educational program, the need for college mental hygiene, the problems confronting the freshmen in making an adjustment to the new environment which he is entering. In short, this program would have as its purpose to make the faculty mental hygiene conscious. A questionaire requesting data regarding the personal maladjustments which have come to his knowledge, might be the first step in arousing the instructor's interest in the problem. I would also suggest the offering of a course of lectures in mental hygiene to be available to the faculty. Reprints of good articles appearing in current journals of psychiatry which deal with the collegiate aspects of mental health might be sent at intervals to faculty members. Certainly the faculty is in the most advantageous position to recognize early symptoms of emotional stress and could do much to prevent the development of more malignant nervous or mental disease.

The second line of defense should be a well-chosen personnel officer in each college. Students in whom the faculty recognize difficulty might be referred promptly to the personnel man for more highly individual guidance. The ordinary problems arising from poor work, wrong methods of study, disciplinary difficulties, irregular hours, the problem of the outside job and its encroachment an the mental and nervous integrity of the individual could be investigated and a very large percentage of them dealt with successfully by the personnel department. Cases could be referred to the psychiatrist when it was felt that a more fundamental psychological investigation was essential. Conferences should take place between the faculty member, the personnel officer, and the psychiatrist for the purpose of discussing individual cases. All colleges have faculty advisers who in most cases do excellent work, but it is my feeling that they should have the support of a psychiatric department when more serious problems threaten. Study of the environmental situation of the student could be carried out most capably by the personnel man and corrective measures could be taken when circumstances indicated it.

An important part of any mental hygiene program is the psychological clinic. Unfortunately such a division is to be found only in the larger universities and in mental hygiene institutions. Vocational psychological studies with recommendations as to a life work most suited to the individual's potentialities have often been sufficient to turn the course from mental chaos to mental order. The lack of a definite educational goal is one of the most potent sources of mental conflict and its resulting emotional distress. One can scarcely over-emphasize the feelings of insecurity which assail the average college senior who has gone to the institution of higher learning solely for a degree, or because in his social level it was the thing to do, or because it would be a blow to his family if he failed to finish college. Fitting round pegs into round holes should be the work of the psychological clinic. Emotional problems not met by such a procedure should be referred back to the psychiatrist. I might suggest that it would be wisest for all cases referred for vocational psychological guidance to go first through the hands of the psychiatrist.

As it now stands in our University, the chief source of material for psychiatric investigation and treatment is the medical group in the Student Health Service. This is logical since acute emotional distress is almost always reflected in physical symptoms. The conversion of mental conflict into somatic symptoms is one of the fundamental facts which a well-trained medical man would not fail to recognize. Not all students with psychic disturbance appealing to the medical, surgical, or other departments of the Student Health Service need reach the psychiatric department. Many cases of anxiety over physical symptoms can be and have been satisfactorily dealt with by the other medical men. As long as the medical staff is mental hygiene conscious, the proper cases will undoubtedly be referred to the psychiatrist.

Probably the fundamental need is to reach the student directly. I would suggest that the student body be acquainted with the fact that the mental hygiene organization of the University is available for the discussion of individual problems and that there *is* a service founded primarily to assist students who find themselves aimless, inefficient, unfitted for the professions they seek to attain, or who discover themselves floundering about and in danger of being submerged by personality problems.

In some of the smaller institutions I would favor the formation of a college committee on Mental Hygiene made up of the dean, the chairman of the student personnel department, and the psychiatrist attached to the student health service.

Prospective patients could be discussed with the psychiatrist and recommendations for curricular changes, further investigation, leaves of absence for adequate treatment or alterations in vocational program could be taken up directly and in detail.

The cardinal points in my discussion and those I should like to leave with you are:

1. The magnitude of the problem can only be appreciated by reference to trustworthy statistics furnished us by men who have worked extensively in the field of college mental hygiene. These data assume new significance when reflected back to us from the industrial world where their stern practical meaning commands our attention; and from the practicing psychiatrist who views the problem from the standpoint of failure in personnal relationships.

2. The primary purpose of college should not be the stimulation of scholarship alone, but the training for well-rounded development of the personality. Our educational philisophy should be to foster the growth of an emotionally sturdy, intelligent, self-sufficient, physically healthy, individual possessing good insight and a good sense of reality.

3. I have tried to present a simple, workable scheme for the organization of a useful mental hygiene program. If the need is recognized, any scheme that is formulated will be better then none.

4. A cross section of the material reaching the college psychiatrist does not differ materially from that of the average practicing psychiatrist dealing with the general population. The only differences, perhaps, are that we are observing youthful minds undergoing stresses to which they may never again be subjected, and that therapeutic rewards are richer than in any other field with the possible exception of pediatrics.

5. There exists today an available body of knowledge which in the proper hands will serve to harmonize the conflicting elements of personalities caught in emotional crises.

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DISCUSSION OF DR. HAROLD D. PALMER'S PAPER ON MENTAL HYGIENE PROBLEMS IN A UNIVERSITY

By

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I hope that the expression of my congratulations to Dr. Palmer on his excellent address dealing with mental hygiene problems in a University, will be looked upon, not as merely conventional, but as sincere as I genuinely feel it to be. His paper not only covers the field of psychiatric practice in the University community, indicating the nature of the material to be dealt with, its special problems, and contributing much to the solution of those problems, but it raises many questions of theoretical and practical importance. This should be the function of any address—to raise questions, widen horizons, stimulate, as well as to offer practical data of observation. My comments can themselves be divided into theoretical and practical issues. With the enthusiasm of most psychiatrists I am intrigued by theory, but fortunately, I suppose, I am restrained from flights into psychological fantasy by the exigencies of the demand for psychiatric treatment in our own department of Student Health Service in the University of Chicago.

As therapist, one must find solutions for problems. Substantially our practical experience with the incidence of different types of cases is that of Dr. Palmer's. That is, that by far the greater proportion of cases are ill-defined types of neurotic behavior with anxiety as the leading symptom. Next come mild depressions—then severe depressions, and finally the schizophrenics —a term which I think is quite misleading and is dangerous because of its implication of a bad prognosis. On this last point of the schizoid personality, I cannot share Dr. Palmer's somewhat pessimistic views for our experience has been very encouraging, and I am personally coming to believe that we must tear down and rebuild our psychiatric conceptions of this whole field of the so-called "split" personalities. We have, too, a more than generous sprinkling of homosexuality, other types of sexual perversion, impotence and frigidity. With regard to homosexuality, we are quite optimistic, though admittedly it is an exceedingly difficult neurosis to treat. I should like to ask Dr. Palmer if he really believes there is such a thing as a biological-homosexual-in-

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The Cardiac Pathology of Diabetes Mellitus*

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IN RECENT years a number of reports dealing with the cardiovascular complications of diabetes have been published, and the frequency of this condition emphasized. In 1930 there were 1784 deaths in diabetic patients in New York City, of which more than half were due to cardiovascular disease.[1] Joslin[2] has noted a relative increase in vascular deaths since the introduction of insulin (Table 1) and has indicated a high incidence of cardiac involvement. The data included in the present report was obtained from an analysis of the records of one hundred autopsied diabetics from the Department of Pathology of the University of Minnesota and from an analysis of the electrocardiograms of forty diabetic patients. The purpose of this study was to determine the incidence and type of cardiac involvement in diabetes.

TABLE 1
INFLUENCE OF PERIOD OF TREATMENT UPON PERCENTAGE OF TOTAL DEATHS FROM DIABETES DUE TO ARTERIOSCLEROSIS AND DIABETIC COMA (JOSLIN)

Increase of Arteriosclerotic Deaths Since the Introduction of Insulin

Epoch—	Average Duration of Diabetes, Years	Deaths, Total	Coma, Per Cent	Arterio-sclerosis Per Cent	Average Age at Death, Years
Naunyn: 1894, to June, 1914	4.7	342	61	15	44.8
Allen: June, 1914, to August, 1922	5.4	805	42	26	....
Banting: August, 1922, to July, 1926	7.7	609	20	47	54.2

The association of diabetes and cardiac pathology was first observed by Seegen in 1864.[3] Huchard[4] and Mayer[5] emphasized this association in 1888. Brunton[6] in 1907 also observed the frequency of heart involvement in diabetes. More recently several statistical reports have appeared. Warren and Root[7] found, in seventeen autopsies on diabetics above the age of forty, eight cases with marked coronary disease and myocardial degeneration. Cardiac involvement was apparently more frequent in the obese. Wilder[8] in fifty-eight autopsies found 34 per cent showing extensive coronary disease. Blotner[9] found coronary sclerosis as a definite pathological lesion in 45 per cent of seventy-seven autopsied diabetics. Enklewitz[10] found twenty-six cases of coronary thrombosis in ninety-two diabetics that came to autopsy.

The data in the present study was analyzed to determine the general incidence and type of cardiac involvement in diabetes, the comparison with non-diabetics, and the age and sex distribution of those showing cardiac pathology.

Incidence and Type of Cardiac Pathology—Of the 100 autopsies, cardiac pathology was found in forty-six cases, or 46 per cent. In forty-one of the forty-six cases the pathological lesion was extensive sclerosis of the coronary arteries. There was one instance of luetic aortic regurgitation, one of chronic rheumatic mitral defect and three cases of hypertension heart without coronary involvement. It was apparent that the characteristic cardiac lesion of diabetes was coronary sclerosis, that other types of cardiac disease were relatively rare and the association with diabetes merely coincidental. Consequently subsequent study was continued on those cases showing coronary arterial disease.

Comparison with Non-diabetics—Since coronary disease is a fairly common condition especially after the age of fifty, it seemed necessary to compare the incidence in non-diabetics and diabetics. Table 2 shows the incidence of severe coronary disease in 339 consecutive autopsies from general postmortem material.[11] There were twenty-one, or 8.2 per cent, with this condition above the age of fifty. Table 3 shows an incidence of 52.7 per cent of coronary disease in diabetics above the age of fifty. The difference in the two groups is thus very striking, indicating that coronary disease is approximately six and one-half times more frequent in diabetics above the age of fifty than in the general population.

TABLE 2
INCIDENCE OF CORONARY DISEASE ABOVE THE AGE OF FORTY

Coronary Disease by Decades in General Autopsy Material

Age, Years	Autopsies	Coronary Disease No.	Coronary Disease Per Cent
40 to 49	90	6	6.6
50 to 59	94	6	6.4
60 to 69	105	10	9.5
70 to 79	42	5	7.0
80 to 90	8	..	...

*Presented before the Minneapolis Clinical Club, February 8, 1934.

Age Distribution—Table 3 shows the incidence of coronary disease by decades. While the incidence was low in the earlier decades, there was a sharp rise about the age of fifty. Of the twenty-six autopsies below this age there were but two cases of coronary disease, or an incidence of 7.7 per cent. Coronary disease was present in thirty-nine, or 52.7 per cent, of the seventy-four autopsies above the age of fifty.

TABLE 3
CORONARY SCLEROSIS IN DIABETES
Incidence of Coronary Disease by Decades in 100 Autopsied Diabetics

	Autopsies	Coronary Sclerosis No. of Cases	Coronary Sclerosis Per Cent
	100	41	41.0
Age—			
10 to 20	1	..	.....
20 to 30	2	..	.....
30 to 40	11	1	9.0
40 to 50	12	1	8.0
50 to 60	27	14	52.0
60 to 70	33	17	52.0
70 to 80	12	6	50.0
80 to 90	2	2	100.0
Above age of 50	74	39	52.7

Sex Distribution—Table 4 shows the incidence of coronary disease according to sex. The ratio of male to female was 1.8 to 1. In a group of non-diabetics, it had been previously observed[11] that the proportion of males to females showing coronary disease was 3 to 1. It is apparent that the comparative immunity of the female to coronary sclerosis is distinctly lessened in diabetes.

TABLE 4
Distribution by Sex of Coronary Disease in Diabetes

	Autopsies	Coronary Sclerosis No. of Cases	Coronary Sclerosis Per Cent
Males	57	29	50.9
Females	43	12	28.0

Diabetes and Hypertension—There has been considerable difference of opinion as to the frequency of the association of hypertension and diabetes. The reports of Major[12] and Joslin[13] indicate that hypertension is not a prominent feature in diabetes. Hypertension may be recognized at autopsy by the presence of cardiac hypertrophy which is not associated with such conditions as valvular disease, adherent pericardium or chronic glomerulonephritis. Table 5 shows the weight of the heart in ninety-eight cases. Cardiac enlargement of the hypertension type was present in 17 per cent above the age of forty. Bell and Clawson,[14] in general autopsy material, found hypertension heart in approximately 12 per cent above the age of forty. This indicates that using heart weight as a criterion, hypertension is only slightly more frequent in the diabetic than in the general population.

TABLE 5
HEART WEIGHT
Weight of Heart in Ninety-eight Autopsies on Diabetics

Grams	Coronary	Non-Coronary
100 to 199	..	1
200 to 299	3	25
300 to 399	8	21
400 to 499	20	8
500 to 599	9	2
600 to 699	1	..
Below 450 grams	29	52
Above 450 grams	12	5

Coronary Disease and Peripheral Gangrene—Wilder[8] reported that coronary disease was more frequent in diabetics with peripheral gangrene. In fifty-eight autopsies on diabetics he found 34 per cent showing extensive coronary disease. He noted, however, an incidence of 75 per cent in the cases with peripheral gangrene. In the present series of 100 autopsies, there were twenty-one instances of peripheral gangrene. Thirteen or 62 per cent showed extensive coronary sclerosis. These observations also indicate a greater frequency of coronary disease in diabetics with gangrene.

Coronary Thrombosis and Diabetes—Levine[15] observed in his 145 cases of coronary thrombosis that there were thirty-four, or 24 per cent, with glycosuria or known diabetes. Blotner[9] found coronary thrombosis in 10 per cent of his seventy-seven cases of diabetes. Enklewitz[10] found twenty-six cases of coronary thrombosis in ninety-two diabetic patients that came to necropsy. In the writer's analysis of 113 cases of coronary sclerosis[11] there were twenty-four instances of coronary thrombosis. Diabetes was present in 25 per cent of these cases.

Cause of Death—A cardiac death occurred in only a portion of the cases showing coronary disease. In thirty-five cases, the manner of death was quite definite, as follows: a cardiac death occurred in eighteen, of which eleven were congestive heart failure and seven anginal; the remaining seventeen deaths were due to a variety of causes. In none of the latter group were there any clinical features indicative of coronary disease. It is apparent that coronary involvement must be suspected in the diabetic in the absence of a clinical picture of heart disease. Blotner[9] found in his series of diabetics that a cardiac death occurred in 43 per cent of those having coronary disease. Acidosis was present in but three cases.

Electrocardiographic Studies—Electrocardiography is the most accurate objective method for the clinical recognition of coronary disease. Abnormalities are found in about 75 per cent of cases. Forty elderly diabetics were studied by this method and alterations in the electrocardiogram were found in 40 per cent. In order of

frequency the abnormalities were (1) inversion of the T wave, (2) low amplitude, and (3) notching and widening of the QRS. These changes are similar to those which have been previously reported in coronary disease.[16] The results of this study agree closely with the findings of Hepburn and Graham,[17] who found abnormal electrocardiograms in 45.5 per cent of a series of 123 diabetics. In the present series, the graphic evidence of coronary disease preceded the clinical manifestations in several cases. (Fig. 1) In most clinics it is considered a routine procedure to study the condition of the peripheral vessels by palpation and by X-ray of the extremities. In view of the high incidence of coronary disease in diabetes, it would certainly be a proper procedure to investigate routinely the coronary vessels by means of the electrocardiograph.

Significance of Coronary Disease in Prognosis and Treatment—The recognition of the cardiovascular pathology is important both in prognosis and treatment. Since coronary disease is usually associated with mild diabetes, a favorable prognosis would be made if based entirely on the metabolic disturbance. The diagnosis of the associated coronary arterial pathology decidely alters the outlook, as the anginal syndrome or congestive heart failure may develop at any time and not infrequently when the diabetes is improving. As regards the influence of the coronary pathology upon treatment, it has frequently been observed, since the introduction of insulin, that with the more rigorous treatment of the diabetes the cardiac manifestations may become more severe instead of improved. A number of observers have also demonstrated that insulin hypoglycemia represents a true damage to the myocardium. It is difficult to determine the carbohydrate requirement of the heart, but there is evidence that the diseased heart requires a greater amount of carbohydrate than a normal heart. Whatever be the explanation, it appears that lowering the blood sugar by rigid diet or insulin or both may aggravate the cardiac condition markedly. Soskin and his associates[18] showed by well-controlled studies that, if the diabetes was strictly controlled with blood sugar levels usually considered normal, elderly diabetics frequently developed an increase in cardiac manifestations subjectively and objectively. This was indicated by the appearance of anginal attacks, arrhythmias and electrocardiographic changes. If the blood sugar was permitted to rise by reduction of insulin or by increasing the diet, these manifestations promptly disappeared. The conclusion was that higher blood sugar values are often the optimum for the cardiovascular status, and it is, therefore, best to undertreat the elderly diabetic, especially if there is evidence of coronary arterial pathology. Blotner[9] emphasized also the danger of a rapid lowering of blood sugar as he observed four fatal cases of coronary thrombosis in diabetics which apparently followed a sudden reduction in blood sugar with insulin.

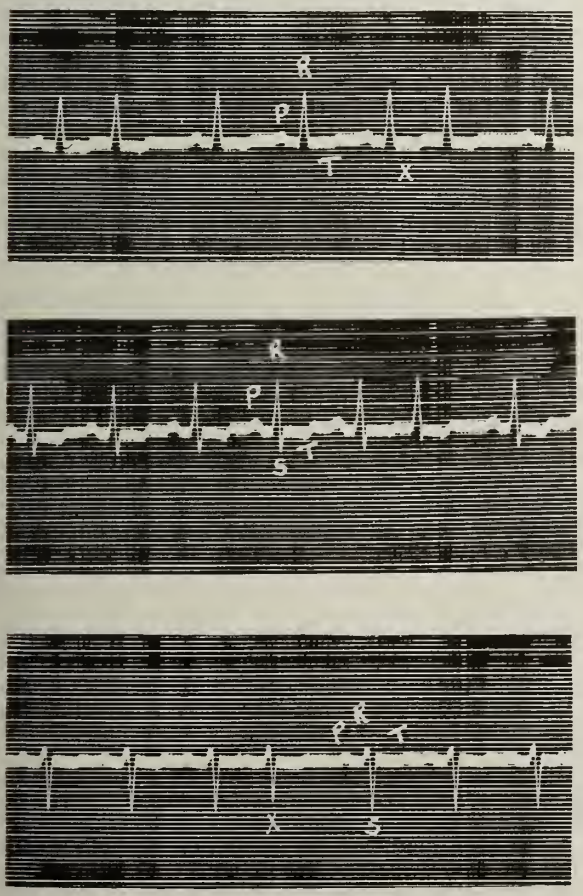


FIGURE 1

Electrocardiogram of O. J., a diabetic of ten years' duration. Record shows T wave inversion indicating coronary disease six months before the onset of anginal attacks.

Conclusions

1. Coronary sclerosis is the predominant cardiac lesion of diabetes mellitus.

2. Coronary disease is relatively infrequent in the earlier decades, but after the age of fifty, the incidence is above 50 per cent.

3. Above the age of fifty, the incidence of coronary disease is six and one-half times greater in diabetics than in non-diabetics.

4. Hypertension is not a prominent feature in diabetes.

5. Electrocardiography is suggested as a routine diagnostic procedure in elderly diabetics.

6. The recognition of the cardiac pathology is important in prognosis and treatment.

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Mental Hygience Problems in a University

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dividual? That is, one whose homosexuality can be explained on the basis of an endocrinopathy on inheritance. Perhaps this is not what he implied for I think the evidence is increasing that homosexuality is merely a social maladjustment as is neurosis or drug addiction or prostitution. Moreover, our clinical results are encouraging.

I sometimes think that one of the worst mistakes in our attitude toward the problem of homosexuality and sexual perversion in general is the over-emphasis we place on them and fear of them that exists in the average person's mind. Many students, both men and women, come to us with such a fear, and it seems that this state of mind is simply the modern form of the puritan conscience of our country which originally made a dichotomy between God and the devil, and now in its sophisticated agnosticism has transposed those guiding fictions of the ambitious puritan into science, on the one hand, and sexual neurosis on the other. Furthermore, I am afraid that much of our psychiatric theory, by means of which we attempt to treat these problems, is, with its emphasis on unconscious drives, repression and suppression, ego, super-ego, and id, as demonological as primitive religion. All neurosis, sexual perversion, drug addiction, and other problems of our Western civilization, are social problems and arise from defective development of the social interest in each individual. If this is true, we can understand the weighty implication of Dr. Palmer's paper when he suggests that the college student is not rightly prepared for life in all its aspects. We psychiatrists, as well as social workers, and other therapeutic agents of modern society, are a comment on the failure of modern society, rightly to educate its members, firstly by the parents in the home, secondly by the primary schools, and finally by the institutions of higher education—our Universities.

It seems to me that modern psychiatry is uselessly trying to patch up a leaking dike or dam unless it repeatedly calls attention to, and offers practical solutions for, the source of all personality defects, coming as they do from faulty education in the early years of life. From a strictly therapeutic angle, however, the adolescent and young adult, whether college student or not, offers the greatest hope for the correction of mistaken social adaptation, and therefore I think that Dr. Palmer's suggestions for the extension of mental hygiene service in the University, should not only be followed but expanded even further.

The Clinical Application of Renal Functional Tests*

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THE estimation of renal function stands out pre-eminently as the most vital factor in the management of patients coming under the care of the urologic surgeon. It is a fact, borne out by experience, that provided renal function is adequate and at a stable point complications of the cardio-vascular and pulmonary systems occur less frequently as sequellae to the surgical treatment of the urologic patient.

It is to be understood that this is a discussion of laboratory procedures and that the clinical evaluation of the patient's status is not to be supplanted by a study of cases by figures or graphs. The discussion will concern the more simple tests which may be carried out by an practitioner as well as those in common use by American urologists at this time.

Classification

Renal function tests may be divided into two general groups:

I. Tests of elimination.
   a. Endogenous tests which estimate the elimination of urea and salts.
   b. Exogenous, as in the estimation of the elimination of foriegn substances.

II. Biochemical tests of the blood.

Endogenous Elimination Tests

1. The simplest elimination test is the so-called "Dilution Test" and its is carried out by the patient ingesting 1500 c.c. of water after voiding in the morning. Urine specimens are collected at short intervals until noon, the quantity and specific gravity of each specimen being measured and recorded. The urine excreted from noon to the end of the twenty-four hour period is collected as a single specimen, its quantity and specific gravity is measured and noted. The total urine excreted should be from 1200 c.c. to 1800 c.c. while one specimen should have a specific gravity of a least 1.003 with a gradual progression up to at least 1.020.

Probably the most invaluable use of this test is in the discovering of an incipient nephritis by its means, but it is only a measure of the lessoning of the versatility of renal function and is of little value in the estimation of absolute renal insufficiency. Its disadvantages are the possibility of injuring already damaged kidneys by the ingestion of so large a quantity of fluid at one time and the fact that it is subject to various extra-renal factors.

2. The Mosenthal Test Meal is no doubt the most reliable and the simplest of the endogenous elimination tests. It is carried out by the patient ingesting a stipulated intake of fluid and food. Two hour urine specimens are collected until six are obtained and the remainder of the twenty-four hour urines are collected as a single specimen. The quantity and specific gravity of each specimen is measured and recorded and renal function is estimated from these results.

This test demonstrates the versatility of renal function by showing a variability of ten or more points in the specific gravity and by demonstrating a balance between the intake and output of salt nitrogen and fluid. The volume of the over night urine is usually 400 c.c. or less, while its specific gravity is expected to be 1.016 or higher. Fixation of the specific gravity at either a high or low point is of significance as an indication of some derangement of the versatility of renal function.

3. The dilution and concentration test of Volhard and Fahr, has no particular advantage over the Mosenthal test and it is more elaborate, while the possibility of its throwing undue stress upon already damaged kidneys must be borne in mind.

4. The determination of Ambard's constant has been a popular means for the estimation of renal function with some European clinicians, but it has had relatively few adherents among the Urologists in this country. It consists of the estimation of a ratio between the concentration of urea in the blood and the amount of urea eliminated in the urine in a certain period of time.

Altho quantitative polyuria tests are reliable and are based upon physiologic principles, they refer to the functional reserve of the kidney; small, or even large pathologic lesions will not be detected by such tests, thereby partially discrediting their application for surgical purposes.

Exogenous Elimination Tests

Various substances have been proposed for the

*Read before the Hennepin County Medical Society, Minneapolis, Minn., February 7, 1934.

estimation of renal function by the introduction into the body of a known quantity of a substance and subsequently estimating the quantity excreted in the urine. Foremost among these have been numerous dyes; fuchsin, methylene blue, roseanalin, indigocarmine and phenosulphonphthalein, but only the last two mentioned are in general use today.

1. While the application of indigocarmine quantitatively for the estimation of combined renal function has been almost entirely superceded by phenosulphonphthalein, it still remains the most practical differential renal functional test for all conditions with which the Urologist is confronted. Its employment, usually intravenously, is so simple and the technic so well known that its description will not be undertaken here. Qualitatively, by meatoscopy, if the dye does not appear within ten minutes after intravenous injection, or if the initial light blue coloration does become more concentrated, disease of the respective kidney or ureter should be suspected. Normally in 90 per cent of patients it will make its appearance in from 2½ to 4½ minutes, and from 20 per cent to 40 per cent of it will be eliminated in one hour after intravenous injection.

2. Since the introduction of phenosulphonphthalein by Rowntree and Geraghty in 1910 it has remained the most useful test of renal function available to the physician. The technic of the phthalein test, either intravenously, intramuscularly or by the subcutaneous method is familiar to you all. Within recent years the intravenous method of its administration has been most popular among American Urologists. This is because of the more accurate results regularly obtained than by the other methods.

Failure of the phthalein test to evidence renal functional damage in many cases of various types of nephritis, cardiovascular and hypertensive diseases, has lead the internist to regard it as lacking in sensitiveness and of being incapable of detecting early renal lesions. This fact lead Thomas in 1914 to publish his work on the index of elimination. Working at first with indigocarmine, and later with phthalein, he was able to more accurrately estimate the functional capacity of the kidneys by means of a fractional collection of the excreted dye. Later Shaw of the Brady Institute published his study of the curve of the elimination of phthalein which is the most popular fractional method in use today. Accurracy demands that the amount of dye be carefully measured and administered intravenously. The patient is permitted to take fluids freely during the period of the test. Four half hour specimens are collected and the percentage of eliminated dye in each is estimated. The normal excretion of the first half hour period should be approximately five times the concentration of the excreted dye of the third half hour. Delayed concentration or early complete elimination of the dye is brought to light by this means. The phthalein test has been used for the quantitative unilateral or differential kidney function test but its accurracy here has been questioned due to extra renal factors such as drainage difficulties and catheter leakage. For this purpose its employment has been largely replaced by indigocarmine, but phthalein remains the most simple and reliable test of glomerular function.

Biochemical Tests of the Blood

Various biochemical tests of the blood are in use, the utility of which are dependant upon the determination of nitrogen retention. All nitrogen retention tests should be done on a fasting stomach, and with an average fluid intake. Nitrogen retention is obviously dependant upon bilateral renal disease.

1. The determination of the non-protein nitrogen of the blood is one of the most dependable methods of estimating nitrogen retention. While the determination is somewhat more complicated than the blood urea test its employment is sometimes of distinct advantage in certain types of glomerular nephritis. The normal for this test varies between 25 and 40 mgs. per 100 c.c. of blood, dependant upon the diet and other factors.

2. The blood urea nitrogen determination, because of its greater simplicity is the most popular method of determining the nitrogen retention. The normal values range from 10 to 20 mgs. per 100 c.c. of blood. Figures above 30 mgs. should be regarded with suspicion by the surgeon.

3. Most Urologists consider the blood creatinine test as being unnecessary for the average case undergoing functional study. When it is used it serves as an additional check upon the other findings. In cases where the blood urea remains high consistantly, the creatinine determination should be made as it is acknowledged to be elevated in terminal renal disease.

4. The urea salivary index as proposed by Hench, has been checked with the blood urea test and has been found to give results as equally reliable. It may be employed in the abscence of the necessary equipment for the blood nitrogen tests.

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Clinical Significance of Low Basal Metabolic Rate*

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THE utilization of respiratory calorimetry as a test of activity of the thyroid gland has resulted in one of the most satisfactory functional tests at our disposal. The success of the method is based on the close relationship that exists between the rate of consumption of oxygen by the body and the degree of activity of the thyroid gland.

Approximately 40 per cent of the consumption of oxygen by a normal individual under basal conditions is controlled by the thyroid gland; this is demonstrated by the fact that complete destruction of the thyroid gland causes the rate of metabolism to drop to about —40 per cent. There are factors other than primary pathologic structural changes in the thyroid gland, however, which can, under certain circumstances, cause abnormal lowering of the rate of consumption of oxygen. Probably the best known examples of such conditions are severe undernutrition and pituitary insufficiency. Whether such conditions bring about a lowered metabolic rate indirectly by their effect on the thyroid gland or whether they exert a direct and independent influence on oxidation of tissue, is not known. Depression of the rate of metabolism resulting from destruction or extirpation of the thyroid gland can be attributed to hypothyroidism, but depression of the metabolic rate that occurs during starvation may be brought about by an entirely different mechanism, although it is possible that the thyroid gland may be involved.

Relation of Low Metabolic Rate to Thyroid Gland

Low basal metabolic rates which are known to be the result of involvement of the thyroid gland occur in colloid goiter, during certain periods in the development of the goiter when the thyroid gland is unable to supply sufficient thyroxin, in myxedema and in cretinism resulting from destructive processes in the thyroid gland and, occasionally, following exophthalmic goiter. A low rate of metabolism in these instances may be designated "primary hypothyroidism." The term "secondary hypothyroidism" may be used to designate those conditions associated with low basal metabolic rates in which the relationship of the thyroid gland to metabolism has not been definitely determined.

Colloid Goiter—Hypothyroidism is by no means constantly associated with diffuse colloid goiter, but the presence of a colloid goiter is always evidence of constant or periodic difficulty on the part of the thyroid gland to produce the thyroxin required by the tissues of the body. In most cases of colloid goiter the basal metabolic rate is within normal limits, and it is impossible to demonstrate actual hypothyroidism, but in a number of cases, and particularly during the period of progression of the disease, the basal metabolic rate may be subnormal and the physical signs may suggest hypothyroidism. The basal metabolic rate does not fall below —18 per cent. With the subnormal rate, evidences of mild hypothyroidism usually exist, especially pallor, dry skin, intolerance to cold, and lack of energy.

Evidence indicates that the most important factor in the production of colloid goiter is a deficiency in available iodine. This deficiency in iodine at a time when there is a heavy demand on the thyroid gland, for example, at puberty, or during adolescence and pregnancy, periods in life in which colloid goiter is most likely to occur, apparently determines the development of the colloid goiter. The actual enlargement of the thyroid gland is the result of an excess of colloidal material in the acini and, at times, there is evidence of increased flow of blood to the gland in an attempt to extract the needed thyroxin, indicated by the presence of bruits and thrills at the thyroid poles. Undoubtedly, there are other factors active in the production of colloid goiter.

Plummer has shown that intravenous administration of 5 to 10 mg. of thyroxin to an individual with a diffuse, vascular, colloid goiter and low basal metabolic rate will cause bruits and thrills to disappear in eight hours, and the gland may diminish by as much as a third in twenty-four hours. Thus it is possible that if the requirements of the body for thyroxin are satisfied, stimulation of the thyroid gland subsides and the cause for enlargement and increased vascularity of the gland is removed. Severe colloid goiter is uncommon in the United States, particularly since the widespread use of iodine.

*Read before the Sioux Valley Medical Association, Sioux City, Iowa, Tuesday, January 23, 1934.

†Division of Medicine, The Mayo Clinic.

Myxedema—Myxedema, with rare exceptions, is the result of thyroiditis or thyroidectomy. When the thyroid gland has been resected, or when it has been destroyed by inflammation to such an extent that it is unable to produce sufficient thyroxin to supply the demands of the body, hypothyroidism results. When the metabolic rate drops below —20 per cent, the changes in tissue characteristic of myxedema begin to appear, and one of the most striking of these changes is generalized non-pitting edema. It is impossible to review in detail the symptoms of myxedema in this paper. The great variety of complaints presented by patients with myxedema has often been emphasized in the literature and the possibility of a multiplicity of symptoms is realized when we consider the extent of the disease and the fact that the abnormal metabolism associated with it involves all tissues of the body. Frequently, it is brought to the attention that the most important step in the diagnosis of myxedema is to keep the disease in mind, for the general appearance of the individual with myxedema usually is pathognomonic. To a great extent, this characteristic appearance is the result of swelling about the eyes and face and dryness of the skin. These findings, together with alopecia and dryness of the hair, mental and physical slowness, deliberate and thick speech, aching and pain in the joints, and marked intolerance to cold, produce the distinctive clinical picture.

Exophthalmic Goiter—Following thyroidectomy for exophthalmic goiter, the basal metabolic rate may become subnormal and, occasionally may reach such a low point that myxedematous changes supervene. The most obvious explanation of such a development would be that an insufficient remnant of thyroid gland is present. However, this explanation is not always applicable, as is indicated by the fact that the same condition may develop during a spontaneous remission of the disease in cases in which operation has not been performed. In either instance, severe recurrence of exophthalmic goiter may subsequently develop. A review of pathologic changes of the thyroid gland, in those cases in which a low metabolic rate followed thyroidectomy, indicates that thyroiditis is a frequent finding, and it seems logical to attribute thyroid insufficiency in some of these cases to persistent thyroiditis in the remaining portion of thyroid gland. Apparently a low basal metabolic rate following exophthalmic goiter occurs more frequently in cases in which there has been prolonged administration of iodine after operation, and the rate often can be elevated by discontinuing the iodine.

Relation of Low Metabolic Rate to Undernutrition

Aside from myxedema, the condition which is most consistently accompanied by marked lowering of the metabolic rate is severe and prolonged undernutrition. Careful and complete studies of cases of voluntary fasting for prolonged periods are contained in the literature. One of the most striking results of such starvation has been the marked drop in basal metabolic rate. It has been demonstrated, also, that there is not a prompt return to normal metabolism following feeding. Lusk has stated that "the nutritive condition of the body, and not a large influx of food on the day previous, determines the height of the metabolism." Benedict and his associates have demonstrated that less severe degrees of undernutrition in healthy individuals are accompanied by a drop in the rate of metabolism. The cause of this deviation from normal in the presence of undernutrition is not known, but since the basal metabolic rate is a measure of the production of heat by the body, and since with a decreased production of heat the food requirements are less, it is evident that the lowered rate of metabolism results in conservation of the tissues of the body and serves to prolong life during starvation.

A low rate of metabolism, secondary to undernutrition is encountered clinically in a number of conditions, such as, for example, lesions of the digestive tract which interfere with proper nutrition, and during convalescence from prolonged febrile conditions. One of the most striking examples of this secondary low metabolism is anorexia nervosa.

Anorexia Nervosa—Anorexia nervosa is thought to be a functional nervous disturbance. There is a marked distaste for food and, as a result, severe undernutrition develops, often to the extent of actual emaciation. Berkman reviewed a series of 117 cases of anorexia nervosa encountered at The Mayo Clinic between 1917 and 1930, and he found a basal metabolic rate below —10 per cent in 104 cases; the rate was below —20 per cent in sixty-nine cases, and below —30 per cent in twenty-one. In none of these cases was myxedema present. He concluded that the sequence of events in these cases was, first, psychic disturbance causing a loss of appetite and, later, inanition. As a result of this inanition, the basal metabolic rate was lowered. The effect of the low basal metabolic rate was to decrease the requirements for food, which in turn constituted a second reason for decreased appetite. In this manner a vicious circle was established.

The obvious therapeutic indication in these cases is to increase the intake of food, but this is often difficult, primarily because of the patient's distaste for food and also because of the development of a certain degree of intolerance to food during the prolonged period of undernutrition.

Attention to the nervous or psychic disturbances of the patient is of paramount importance as this is the primary cause of the disease. If the low rate of metabolism is corrected by the administration of thyroid gland substance, the food requirements are increased, and a tendency toward improvement in appetite is established, and although such treatment is not directed toward the underlying cause of the condition, it does aid in breaking the vicious circle. Elevation of the rate of metabolism by the use of thyroid gland substance over any prolonged period of time is contraindicated unless it is accompanied by an increased intake of food, as the low rate of metabolism is a protective mechanism compensating to some extent for undernutrition. Similar results have been accomplished by administration of insulin.

Low Basal Metabolic Rate Without Myxedema

A group of cases in which the condition has been designated as "low metabolic rate without myxedema" constitute one of the most interesting and least understood group of conditions in this field. The terms "non-myxedematous hypothyroidism" and "secondary hypothyroidism" have also been applied to this group. Although it is possible that a certain number of these cases represent thyroid insufficiency which is not of sufficient severity or duration to produce the characteristic myxedematous changes, this explanation cannot be extended to embrace all cases, because in many of them basal metabolic rates are well below —20 per cent for a long time, with no evidence of myxedema. In the majority of instances the complaints of nervousness and weakness with no definite localizing symptoms, and in the absence of any appearance of gross failure of health, suggest the diagnosis of chronic nervous exhaustion or anxiety neurosis. After analyzing the various complaints and physical findings, such as weakness, lack of endurance, coldness, drowsiness, dry skin and hair, constipation, and menstrual disturbance, it is often apparent that they could be attributed, rationally, to lowered rate of metabolism. These complaints may not be so striking in other instances, and the patient may complain only of weakness, nervousness, irritability, palpitation, and insomnia; in fact, it is not rare in cases of this type to discover the low basal metabolic rate when the determination has been made because hyperthyroidism had been suspected. In some cases the condition may, in part at least, be the result of undernutrition in the form of mild anorexia nervosa; in others, this is not true, as it is obvious that the patient is well-nourished and the intake of food adequate.

Nevertheless, elevation of rate in cases of low basal metabolism without myxedema may be followed by gratifying improvement. In many instances, however, elevation of the basal metabolic rate is attended by aggravation of symptoms present, and at times one obtains the impression that the low rate may be a physiologic protective device to limit the use of energy which the particular individual can ill afford to expend. It is also probable that in many cases satisfactory results from the administration of thyroid gland substance are nonspecific in effect, the substance acting as a general tonic; in these cases circulation is accelerated, appetite is increased, and all physiologic activity is increased, with general improvement and an augmented sense of well-being.

Relation of Low Metabolic Rate to Pituitary Tumor

It is a well-established fact that definite pituitary insufficiency is uniformly accompanied by a subnormal basal metabolic rate. This is seen in pituitary tumor of the chromophobe type which gives rise to hypopituitarism and Fröhlich's syndrome. Cushing and Davidoff reviewed 107 cases of histologically verified chromophobe adenoma of the pituitary gland in which there was clinical evidence of hypopituitarism and they found the average basal metabolic rate was —14 per cent. In twenty-one of the 107 cases the rate was below —20 per cent. Weesener and Crewe have submitted experimental evidence to indicate that the pituitary gland produces a thyrotropic hormone. This suggests the possibility that the low rate of metabolism seen in cases of chromophobe adenoma of the pituitary gland is the result of hypothyroidism secondary to pituitary hypofunction.

Relation of Low Metabolic Rate to Sterility and Menstrual Disturbances

Women with low basal metabolic rates, without myxedema, as well as those with myxedema, frequently are sterile, and elevation of the basal metabolic rate often permits conception. The possibility of low basal metabolism in sterility is of sufficient importance to warrant metabolic determinations in these cases, particularly if no pelvic disease is present and the oviducts are patent. Disturbances of the menstrual cycle are common,

also, in the presence of low metabolic rate, with or without myxedema, and most common among these is menorrhagia. Mazer was of the opinion that the intermenstrual period might be shortened or lengthened by hypothyroidism, but that the quantity and duration of the bleeding were usually increased, and that amenorrhea was uncommon. However, amenorrhea does occur and, occasionally, normal menstruation is established by elevation of the metabolic rate. Mussey and Haines, at the clinic, studied a group of twenty-seven women who had periods of amenorrhea, or marked oligomenorrhea, in which no adequate cause was found and in which the basal metabolic rate was below normal. After elevation of the metabolic rate, twenty-two of these patients improved markedly and among seven, menses were reëstablished at regular intervals. In twenty-two of the twenty-seven cases the patient's general health was subjectively improved.

Treatment

The most satisfactory results from administration of thyroid substance are usually obtained if the basal metabolic rate is maintained between —5 and —10 per cent. The administration of thyroid substance should be continuous for a time sufficient to determine the effect of the elevated metabolic rate. During elevation of the rate, untoward symptoms, such as malaise, headache, and backache may develop, particularly in myxedema. Such symptoms almost invariably subside promptly when the rate is established at the higher level. Often, larger doses of thyroid substance are required to elevate the rate in cases of low basal metabolic rate without myxedema than in the presence of myxedema.

In addition to elevation of the metabolic rate in cases in which it is low, particularly in cases without myxedema, it is important to correct hygienic irregularities that may exist, such as chronic fatigue and dietary insufficiencies.

The Clinical Application of Renal Functional Tests

(Continued from Page 328)

5. The determination of the uric acid of the blood is of doubtful value to the Urologist.

6. Recently the urea clearance test of Van Slyke has been employed by several investigators in an attempt to supplant the the combined excretion and elimination tests with a single test. This test employs the principle of determining the ratio between the urea output per 100 c.c. of urine and the blood urea nitrogen. More evidence and further study will be necessary before a test of this nature will supplant a combination of functional tests.

7. The urea tolerance test has so far been of no practical advantage to the Urologist.

8. No discussion of renal functional studies would complete without a consideration of the carbon dioxide combining power test of Van Slyke. This test possesses great value in the management of post-operative complications not only for the Urologist but for the entire profession.

Conclusion

Renal function tests should be exact and uncomplicated enough to be carried out at frequent intervals.

The blood biochemical tests of nitrogen retention are of indespensible value in the estimation of renal function. When this type of test is combined with some test of elimination or concentration or both they give a valuable index as to the surgical risk involved in the urologic patient.

It is doubtful whether or not a single test will ever be devised which will be infallable to exclusion of all others and to the exclusion of the proper clinical evaluation of the patient's general status.

The
JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA, *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

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South Dakota State Medical Association
The Hennepin County Medical Society
The Minnesota Academy of Medicine
The Soo Railway Surgical Association
The Sioux Valley Medical Association
Great Northern Railway Surgeons' Assn.
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M. E. Herz, *Business Manager*
84 South Tenth Street, Minneapolis, Minnesota

W. L. Klein, 1851-1931

MINNEAPOLIS, MINN., JUNE 1, 1934

MEN IN WHITE

The cinema entitled "Men in White" has deservedly received much favorable comment. On the whole, it is good, and physicians who have not will enjoy seeing it if it is not by now too late.

The scene, however, in which a member of the hospital staff and the resident physician give conflicting orders for insulin, resulting in severe shock to the patient, might well be left out. It is not fair to the profession and sows the seed of fear and mistrust to the detriment of all. There may be a petty jealousy among physicians at times but they do not show it in the way here indicated nor pursue it to the point of endangering the patient.

The episode referred to, serves only to create a moment of tense unpleasantness that detracts from a picture which is otherwise sufficiently exciting, entertaining and quite true to life.

A. E. H.

THE SOUTH DAKOTA CONVENTION

The Fifty-third Annual Session of the South Dakota State Medical Association was held in Mitchell on May 14, 15 and 16. As usual, the first day was devoted solely to the deliberations of the Council and the House of Delegates in which the various committee reports were presented and freely discussed, as well as the reports of the officers covering the activities of the organization in the current year. The Secretary's report indicated a substantial increase of membership in every component district society and the finances in good condition. Despite the adverse business conditions of the past five years which have affected South Dakota just like the rest of the country, no pessimistic trends were discernible in any of the discussions and no curtailment of activity in any direction was suggested. The medical features of the F. E. R. A. were given very thorough consideration and steps were taken to bring about a better understanding with the administrative control in Pierre and Washington and help to secure the elimination of such details as were felt to be objectionable or unworkable. It was voted to continue THE JOURNAL-LANCET as the official organ of the Association for the next five years.

For the scientific program an excellent list of guest speakers and clinicians had been secured and a remarkable amount of interesting and instructive clinical material assembled. No one was surprised at this, for the physicians and surgeons of Mitchell have long been known for their ability to develop and produce good clinical programs. They were pioneers in this work long before the present type of teaching program had been adopted by medical societies generally and this present session was a very typical example of the high standards so established and maintained by the local profession for many years.

Dr. E. W. Jones, of Mitchell, presided acceptably throughout and Dr. H. R. Kenaston, of Bonesteel, officiated capably as chairman of the Council. Dr. W. G. Magee, of Watertown, becomes the new president, with Drs. A. S. Rider, of Flandreau, and J. L. Stewart, of Nemo, as president-elect and vice-president respectively. Dr. J. F. D. Cook, of Langford, was re-elected secretary-treasurer. These officers have all been closely identified with medical organization over a considerable period of time and have shown keen and competent interest in all its details. They can be depended upon to carry on the best traditions of the South Dakota State Medical Association and we predict for it another year of continued progress in the right direction. G. C.

SUMMER DIETS

Food should be changed with the seasons; there's no question about that; especially in a country like ours where the temperature changes are so great with the astronomical rotations.

We all agree that blubber will be an unnecessary article of diet in these parts during the next few months. By the same token, we reason that fats of all kinds may well be reduced, and especially may the frying pan be relegated to the realms of cold storage without any serious calorific distress to the populace in general. Fried foods are fatty and fat produces body heat.

Ice cream and fruit are splendid hot-weather desserts and green, leafy vegetables should be encouraged. The altogether uncooked meals of the nature-faddists are not to be recommended; there is an element of danger in all unsterilized foods. It is said that Pasteur did not allow an uncooked morsel of food to pass his lips for many of his later years believing that deleterious bacteria might so enter the intestinal tract and affect his diabetes.

This summer, alcoholic beverages will be more easily obtainable than they have been for some time and this presents a renewed problem. During the days of so-called prohibition, physicians did not often speak up on this question for several reasons; but now that they are openly back as apostles of moderation, if not temperance or actual abstinence, they will point out the dangers of sun stroke to those who are inclined to partake to excess.

A. E. H.

THE BLOOD-SEDIMENTATION TEST IN TUBERCULOSIS

During the past decade and a half, there has been a very definite renewal of interest in the red cell sedimentation test by such workers as Fahraeus,[1] Linzenmeier,[2] and Höber.[3] This test is based on the fact that when anticoagulents are added to blood, the red cells settle in vitro more rapidly when some diseases exist in the body than in normal persons. In recent years, Cutler[4] has made numerous contributions to this subject and has presented what is now generally known as the graphic method, which combines the former distance and time methods and expresses the actual rate of sedimentation of red cells. The test is not specific since the rate is changed in diseases other than tuberculosis. However, it is very valuable once the diagnosis is established in determining the progressiveness of the lesion, before treatment is instituted, and in following the results of the treatment. In tuberculosis, the increased sedimentation rate may be present before there are any symptoms of the disease. This is not only true of the initial attack of the reinfection type of tuberculosis but also of reactivation of lesions.

Spector and Muether[5] are of the opinion that this test is superior to the thermometer or the leucocyte count in determining clinical as well as pathological activity of tuberculous lesions. Cutler states: "The sedimentation rate is a sensitive measure of the activity of the tuberculous process in the compressed lung and is the last objective evidence of activity to become normal. A return to normal indicates quiescence of the pathological process but does not necessarily indicate stability of the lesion."

A number of other workers, such as Friedman,[6] van Antwerp,[7] and Reilly,[8] have found this test of value. Reilly, after testing thirty-six tuberculous girls between the ages of eight months and fourteen years, concluded that it has an advantage over the usual signs, symptoms, and laboratory procedures in determining activity of tuberculous lesions. However, he found it a more reliable procedure in prognosis than in the diagnosis of tuberculous activity. Therefore, we have reached the time when this test should become a routine procedure when dealing with the reinfection type of tuberculosis among children.

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J. A. M.

NEWS ITEMS

The Montana Public Health Association will hold its annual meeting in Helena on July 9 and 10.

Dr. H. P. Linnar, Minneapolis, was the guest speaker of the recent meeting of the Medical Society at St. Peter, Minn.

Construction of a new government hospital at Wagner, S. D., is to be started at once, at a cost of about $100,000.

Dr. M. M. Heffron, formerly of Rochester, Minn., has moved to Dickinson, N. D., and joined the clinic staff of that city.

Dr. G. A. Landmann, who has served as mayor of Scotland, S. D., for the past 20 years, was recently elected for another term.

Dr. Edward Seguin, who has been in active practice for many years at Eveleth, Minn., died this month, after a brief illness, of pleurisy.

Dr. J. S. Tschetter, Huron, S. D., has been named city commissioner of that city, and will have charge of the public safety department.

The Deaconess Hospital at Glasgow, Mont., is planning to add an addition to its present building this year that will cost about $125,000.

Dr. W. H. Rowe, formerly of Minneapolis, is now located at Fairmont, Minn. The doctor was a graduate of Rush Medical College, Chicago.

Dr. Christian Jepstrup, Kindred, N. D., has returned to his former home at Petersburg, where he will continue his general practice among his old patients.

Dr. N. G. Mortensen, recently suspended as City Health Officer of St. Paul, will seek the office again at the coming fall elections, as he wants a complete vindication.

Dr. H. B. Hannah, Minneapolis, was the guest speaker at the May meeting of the Renville County Medical Society at Olivia, Minn., his topic being "Neuritis."

Dr. V. I. Hart, Minneapolis, was the guest speaker at the monthly meeting of the Rice County Medical Society held at Faribault. Dr. Hart's topic was "Infantile Paralysis."

The license of Dr. M. G. Brown, who for the past year has maintained an office at Dakota, Minn., has been cancelled because of his habitual indulgence in the use of morphine.

Dr. Norman J. Rose has moved from Chicago to Dazey, N. D., where he has opened offices for general practice. Dr. Rose is a graduate of Northwestern University, Chicago.

Dr. Hugh C. Arey, who has been in active practice at Excelsior, Minn., for nearly 30 years, died on May 20 after a short illness at the age of 55 years. Dr. Arey was a University of Minnesota graduate.

Dr. W. A. Fansler, Minneapolis, was one of the principal speakers at the annual meeting of the Nebraska State Medical Association, recently held at Lincoln, Dr. Fansler presenting a paper on "Carcinoma of the Colon."

The Minnesota State Board of Medical Examiners revoked the license to practice medicine of Dr. A. W. Eckstein, who formerly practiced at Mankato, Minn., following his conviction of the crime of abortion.

Dr. Ross Gamble, well known physician of Albert Lea, Minn., died very suddenly on May 7, from a heart attack. Dr. Gamble was only 37 years of age and was a graduate of the University of Minnesota in 1922.

Four Minnesota physicians made addresses at the annual meeting of the National Tuberculosis Association held at Cincinnati last month, Drs. W. S. Lemon, J. A. Myers, G. R. Duncan and E. S. Mariette being the representatives.

Dr. Wm. McK. Housman, one of the pioneer physicians of Sioux Falls, passed away on May 17, at the advanced age of 81 years. Dr. Housman had been in active practice for over 40 years, and will be sadly missed by his many patients.

At the annual meeting recently held at Mitchell, the South Dakota Academy of Ophthal-

mology and Otolaryngology elected officers as follows: Dr. C. E. Robbins, Pierre, president; Dr. R. A. Kelly, Mitchell, vice-president, and Dr. H. L. Saylor, secretary.

At the annual meeting of the South Dakota Medical Association, held at Mitchell last month, Dr. W. G. Magee, Watertown, was elected president; Dr. J. L. Stewart, Nemo, vice-president, and Dr. J. F. D. Cook, Langford, secretary and treasurer.

Dr. E. G. Sasse, Lidgerwood, N. D., was elected president of the North Dakota county and city health officers. Dr. George H. Spielman, Mandan, vice president, and Maysil M. Williams, Bismarck, secretary-treasurer. The conference was attended by 102 public health nurses and doctors.

Dr. J. A. Myers, professor of medicine at the University of Minnesota, and Dr. S. A. Slater, superintendent of the Southwestern Minnesota sanitorium at Worthington, were elected directors of the National Tuberculosis Association at the annual meeting in Cincinnati.

The South Dakota State Nurses Association held a very successful meeting at Watertown last month. The new officers are Agnes Thompson, president; Elvera Nelson, Rapid City, vice-president, and Mary Ochs, Watertown, secretary. The annual meeting of 1935 will be held at Sioux Falls.

Dr. William A. Allen, Rochester, Minn., believed to have been the oldest practicing physician in the United States, died at his home on May 12, resulting from a recent accident. Dr. Allen had been in active practice in his home city for over 62 years, driving his own auto in making his calls up to the time of his death.

Dr. Harry F. Emert, Sarles, president of the North Dakota Board of Medical Examiners, died on May 7 after an illness of only three days with pneumonia. Dr. Emert had always taken an active part in all civic matters, having served as mayor of his home city for several years. He was 48 years of age, and a graduate of the University of Minnesota.

The annual meeting of the Montana Medical Association, which will be held at Helena, on July 11 and 12, will present a very attractive program for their two days session. The president of the American Medical Society, Dean Lewis, of Johns Hopkins, Baltimore; Dr. W. A. Fansler, University of Minnesota; Dr. Peterman, of Marquette University, of Milwaukee, and many others will be present and address the association. Write the secretary, Dr. E. G. Balsam, Billings, for information, programs, etc.

The Minnesota State Medical Association broadcasts weekly at 10:30 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota, is the speaker. The program for the month of June will be as follows: June 6, "Some Heart Disease Problems"; June 13, "Care of Crippled Children"; June 20, "Conjunctivitis"; June 27, "Cancer of Stomach."

Otto S. Paulson, Echo, Minn., who holds a license to practice massage in the State of Minnesota, entered a plea of guilty to practicing healing without a Basic Science Certificate on April 11th, 1934, before the Judge of the District Court at Renville. For some time complaints have been received by the State Board of Medical Examiners that Paulson was not confining his practice to that of massage, but was practicing healing in a substantial way. Although Court was not regularly in session, Judge Baker agreed to accept the defendant's plea of guilty, and after the matter was presented to the Court, the defendant was sentenced to six months in the county jail, which sentence was suspended pending the good behavior of the defendant.

Medical and hospitalization problems naturally will play an enormous part in the National Shrine Convention, when it convenes in Minneapolis, June 18 to 21, with thousands of spectators attending the various events, and the consequent care needed, in case of illness and accident. Under the direction and guidance of Dr. Henry Nelson, Minneapolis, plans have been made to construct first aid and hospital units at every spot where crowds will congregate in large numbers. Fifty physicians will assist in the various units, going on duty at appointed days and hours, during the four-day session. A number of graduate nurses will also assist the doctors in the care of the patients. Medical and hospitalization headquarters will be in the Minneapolis Auditorium, rooms having been assigned on the Fourteenth Street side, where cots and complete first aid equipment have been installed.

The JOURNAL LANCET

Minneapolis, Minnesota
June 15, 1934

New Series
Vol. LIV, No. 12

Ambulant Treatment of Hernia

A. F. Bratrud, M.D.
Minneapolis

THE IDEA of treating a hernia by injection usually brings forth the impression and opinion that it is, and has been, a proven failure. This is probably due to the fact that practically all paraffin injections for this disability did result in failure in practically every case, and in surgical interference for removal of the foreign body. However, I am going to present a preliminary report on opinions and impressions gained from a rather limited experience with this type of treatment, together with knowledge gained from experience, both experimental and practical. It is too early to form any definite conclusion as to final results that come only after many years of experience. In presenting this preliminary report, I wish to express my thanks to Dr. E. T. Bell, of the Department of Pathology of the University of Minnesota, for the pathological work; to Dr. F. McKinney, who aided in both practical and experimental work, and to the Physicians and Hospitals Supply Co. for experimental work in various solutions.

The injection treatment of hernia dates back to 1835, when Velpeau first thought of the idea and successfully treated several patients. Pancoast, in 1844, used a solution, consisting of iodine and Tincture of Cantharides. In 1877, Schwalbe used alcohol instead of iodine. About the same period, Quercus Alba was used by Heaton. A few years later, the injection of paraffin became popular, and this caused, without doubt, the comment and unfavorable opinion that this type of treatment has had up to the present time. It is not surprising that this method has not been accepted, when a study is made of the various formulas used, and the fact that very little experimental work had ever been carried on with an idea to determine the actual results from injection. Pina Mestre, a physician of Barcelona, Spain, reports 10,000 cases where an alcoholic extract of various astringents was used, the basic drug being tannic acid. Mayer reports 3,000 cases, with a 2 per cent recurrence, by the use of Mayers Solution. Much interest was manifested in this form of work, when in 1880 Billroth made the statement that if anyone could obtain a solution that would produce the artificial proliferation of tissue, the radical surgery of hernia would be solved.

There are several contraindications to this method. All types of hernias are not amenable to this type of treatment. Post operative or incisional hernias usually have adhesions or incarcerated abdominal viscera and no definite sac, and should not, as a rule, be so treated. Incisional hernias usually have one hernia that can be diagnosed, but have several potential hernias along the line of the incision. When there is a very small incision, a definite opening can be determined, and the contents can be reduced and held reduced by a properly fitting truss, this hernia can be so treated. This may be treated if it comes under indications later to be mentioned. Incar-

cerated, irreducible or strangulated hernias should not be injected on account of the danger of stragulation. These are distinct surgical conditions. All hernias associated with an undescended testical are surgical. Hernias that can be reduced, but where the symptoms cannot be completely relieved by proper application of a truss, are surgical. Sliding hernias should not be so treated. It is very doubtful if a sliding hernia can be held reduced by a truss. To begin with, I was skeptical about treating direct hernias, but it seems as though the results in direct hernias are just as good as in the indirect inguinal type. Any general surgical contraindication, such as hyperthyroidism and haemophilia should always be considered a contraindication. Laying aside the contraindications, we may state that any inguinal hernia can be so treated, provided that it is reducible and can be held reduced by a proper fitting truss, provided there are no general surgical contraindications. Although a few femoral hernias have been treated with good results, I believe that there is liable to be complications. Several epigastric hernias have been treated with good results. Umbilical hernias should not be treated.

To begin this work, it is absolutely necessary to know how to fit a truss so as to hold the hernia reduced. The pad of the truss should fit over the inguinal ring so as to hold the hernia contents within the abdomen. One type of truss will not fit all individuals. The best truss that I have yet found is a spring type of truss. When properly fitted, the patient can engage in almost any form of exercise he so desires. One case engaged in twenty-eight games of professional basket-ball during the course of his treatment. Trusses are usually fitted low, and very often give relief, but when so fitted they do not hold the hernia reduced, except in direct hernias. They cause the hernia contents to press outward against the fascia of the external oblique and a resultant fraying or thinning out of the fascia, as well as an enlargement of defect in the transversalis fascia. The spring type of truss is not always suitable for a patient with rounded or feminine type of hips. Here an ordinary elastic type of truss is satisfactory. The requirements are that the truss stays where it is put, keeps the hernia retained by a constant firm and continuous pressure and prevents protrusion of any abdominal contents. It is necessary to watch patients regularly to see that the truss fits, as a perfect fitting truss today may be worthless if a patient loses any great amount of weight. The measurement for the spring type of truss is taken about 2 cm. below the crest of the ilium and bringing the end of the tape down to the symphysis pubis. Co-operation on the part of the patient in wearing a truss is absolutely essential, otherwise failure is the result. Several cases have been successfully fitted with a truss, and treated only after having the patient on a reducing diet, and thus reducing the intra abdominal pressure.

The objections which have been mentioned to this type of treatment should be considered. Paraffin injections can be dismissed without further discussion, for it is a well established fact that the method resulted in very few permanent cures. It caused irritation from the foreign body present and required surgical interference, for its removal and the closure of the hernia. The fact that it has been only in the hands of quacks is not a good argument, for it is not so many years ago that reputable medical men were severely criticized for the injection of hemorrhoids or varicose veins, and today they are both accepted and recognized. The socalled Timmerman treatment by alcohol should be discarded on account of the large number of injections required, and the fact that numerous complications have resulted. The fact that irritating solutions cause discomfort and pain sufficient to cause patients to be incapacitated, has not been substantiated. It is true that some cases will have a greater reaction than others, but very few cases suffer sufficiently to incapacitate them from heavy work.

Another objection is the fact that a truss must be worn for a long period of time. A properly fitting truss is of no more inconvenience than a good fitting glove, after the first few days, and provided that the truss is a properly fitting one. I think it can be safely stated that 80 per cent of all hernia cases are wearing trusses at the present time, and that only one out of ten trusses hold the hernia reduced. It has been stated that this is a blind and not a rational procedure. To them I may reply that there is a definite technique and unless this is learned, great harm may result.

A number of complications have been mentioned, Hydrocele, Epididymitis, Orchitis, Sepsis, Strangulation, Sterility, Peritonitis and Abscess. To date I have not had any such complications. There has been swelling of the cord in a few cases, and this has usually occurred toward the end of the treatment, but has caused no serious disability. Only an occasional case will suffer sufficient reaction to incapacitate, and this is only for one or two days. There has been no atrophy of testicles noted at this date. Whether this is going to be a later complication and result in sterility is going to be proven only after a lapse of years. I wish to mention two cases who had a

hydrocele with their hernia. At the beginning of treatment, the fluid would gravitate into the abdomen when lying down. Both these cases had a 50 per cent atrophy of the testicle when first seen. After application of the truss and treatment, there has been no recurrence of the hydrocele, and one of these cases, when last seen, showed a 75 per cent normal size of the testicle. Another argument is that there is not a strong abdominal wall. A number of cases treated have developed hernias on the healthy side after cure was affected on the diseased side. The time elapsed since commencing this treatment is too short as yet to arrive at any definite and final conclusions as to this. One case that was treated, and about a year later died of an attack of influenza, was autopsied by the pathologist at the Midway Hospital. This showed a perfect closure of the internal ring and inability to even force his finger through this region.

Travis and Hall at Bellevue hospital and New York University injected a few hernia cases in 1929, and carried out experimental work on monkeys and dogs. For this they used the Pina Mestre Solution. Their results showed a swelling and edema in ten days. Examination of the indurated areas showed a vigorous proliferation of endothelial and connective tissue cells, plus large mononuclear phogocytes and foreign body giant cells. Two specimens showed trace of the injected substance in the abdominal muscle of the monkey and the omentum of the dog. In this latter, two sections of the tissues from the monkey showed an extensive mechanical rupture and necrosis of the muscle fibres. There were masses of yellow granules engulfed by large multinuclear giant cells. It also showed marked proliferation of fibroblasts with some lymphocytes and plasma cells. There were a few areas of multinucleated regenerating muscle cells and single myclocytes. The omentum showed reddish granules and multinucleated giant cells, some single reticular cells and marked proliferation of fibroblasts.

Various solutions were used in the injection of animals. The solutions which gave the least reaction in both animals and the least reaction in hernia cases treated, consisted of Phenol 50 parts, Alcohol 25 parts, Lloyds Specific Tincture of Thuja 25 parts. This should stand for at least forty-eight hours and then either be decanted or filtered. Pina Mestre Solution was used. The formula is not given, but it consists of a group of tinctures which do not have a standardized strength of tannic acid. Several different strengths of a tannic acid preparation were used, the strength varying from one-half of one per cent up to five per cent. On account of the burning that results from the injection of a tannic acid preparation, various local anesthetics, novocain, nupercain and benzol alcohol, were used. Microscopical report of specimens shows a marked proliferation of fibroblasts with these dipping down between the muscle fibres. This, according to Dr. Bell, as he expressed it, produces a binding effect. There was no infiltration of polymorphonuclear cells or any evidence of necrosis, except in the rabbits injected with Pina Mestre Solution. This was not the orginal Pina Mestre Solution but a solution put up by a pharmaceutical company according to formula. Here fifteen minims was injected at weekly intervals and at the end of six weeks there was necrosis present with marked infiltration of polymorphonuclear cells and lymphocytes. No giant cells were found. Sections where a tannic acid preparation was used showed a denser fibrosis than sections with the Thuja mixture. Injection close to the peritoneum or just within the peritoneal cavity showed no evidence of abscess or necrosis, but a similar picture. The omentum was adherent to the abdominal wall and there was so much proliferation of fibrous tissue as to completely obliterate the peritoneum. Results of injection below the fascia of dogs and rabbits showed a marked proliferation of fascia fibres with no evidence of necrosis. There was no necrosis or infiltration of polymorphonuclear cells. Injection into the peritoneal cavity shows no evidence of abscess, but a similar picture. The omentum was adherent to the abdominal wall, and several loops of intestine were matted together. There was no evidence of necrosis present.

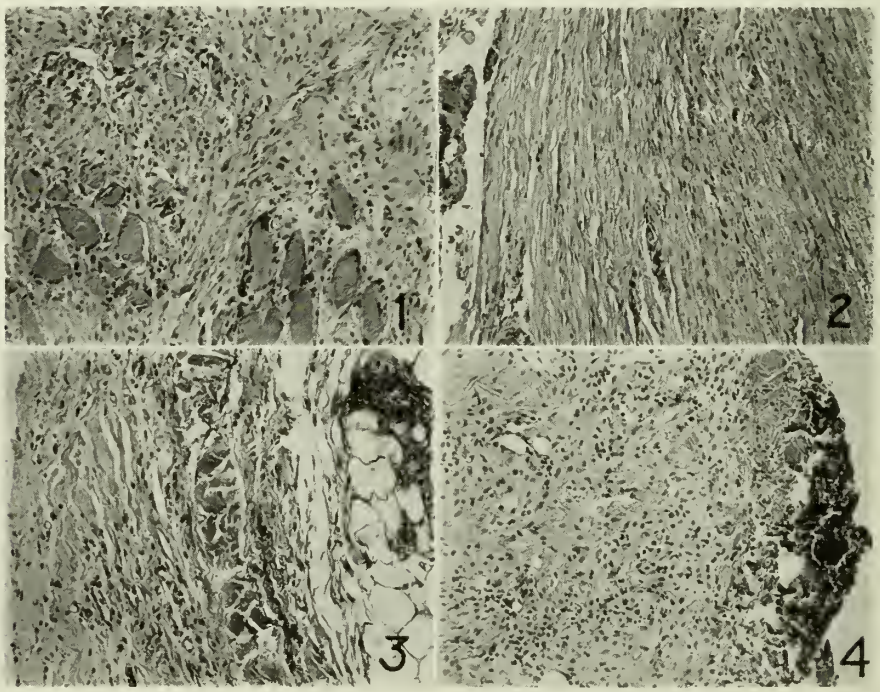
The course in cases treated after injection shows an induration in the region of the injection. This is usually tender to pressure on the day following treatment. Only two cases were of such severity as to incapacitate the patients. Usually after two to four treatments there is sufficient exudate or plastic tissue formation to prevent protrusion of the viscera. There have been a few cases where a swelling of the cord resulted, but this usually subsided in a few weeks. Hot packs relieve the pain when present. The external ring shrinks in size and the fascia can be felt to thicken, so that at the end of a few weeks the external ring will not admit the tip of the index finger. This usually begins after two injections at the external ring. There has been no infection in any case. Cases where a tannic acid mixture was used would occasionally complain of general malaise or feeling as if they had a cold, on the following

day. Practically all patients mention the great relief obtained as soon as they are fitted with a truss, and have had two or three treatments. Very little pain is experienced with a tannic acid preparation when especial care was used in obtaining a chemically pure tannic acid and not injecting over seven or eight drops.

There are several advantages to this form of treatment. The principal one being that it is ambulatory and that the patient continues working; is not confined to the hospital for a period of two weeks, and is not incapacitated for another period of four to eight weeks. There is no question but that the economical issue is of greatest importance at the present time. There is no question but that the recurrence of hernia following surgery is much greater than statistics show, for hernias will recur as long as fifteen to eighteen years after the operation, and it is most difficult to obtain a check for an accurate percentage of recurrences. I do not believe that the recurrences will be as high with this type of treatment as it is with surgery, and especially so if the cases are watched every two months for a period of two years. A number of surgical cases that began to show weakening and beginning recurrence, were fitted with a truss and treated, and recurrence was prevented. I believe that the recurrence of hernia following operation can be practically done away with, provided that the patients are fitted with a truss and compelled to wear it for a period of time after operation.

As the technique has been previously given this will not be discussed in this paper.

Up to the time of the most recent check there has been under treatment four hundred and six hernias in three hundred eighty-seven cases. A very small number of these cases have been only fitted with a truss, on account of the fact that the patients were very old and feeble. Here it was not deemed necessary or advisable to subject this type of patient to any treatment.



1. Microphotograph of a section seven weeks after initial injection of Thuja mixture into the belly wall of a dog. Note the fibroblastic proliferation present and the marked cellular infiltration even in between the muscle fibres. Dr. Bell expressed this as producing a binding effect. There is no infiltration of polymorphonuclear cells or any necrosis present.

2. Microphotograph in which a synthetic tannic acid solution was injected into the belly wall of a dog. There is very marked cellular proliferation showing a denser fibrosis than in sections in which other solutions were used. There is no evidence of necrosis or infiltration of polymorphonuclear cells present.

3. Microphotograph of a section in which Thuja mixture was injected at intervals just at the peritoneal margin. The omentum is here adherant to the abdominal wall, the fibroblastic infiltration having practically obliterated the peritoneum. Several coils of intestine were matted together. The adhesions between the loops of intestines separated quite easily. The omentum separated with difficulty. There was no necrosis present. Similarly there was no infiltration of polymorphonuclear cells.

4. Microphotograph of a section in which Pina Mestre Solution was used in rabbits. Several injections of 15 minims were used. Note the very marked cellular infiltration present. Sections were taken at about six weeks. There is a very marked necrosis present in one area. Also there is quite marked infiltration of polymorphonuclear cells present. The solutions were made according to the formula given by Pina Mestre. At the present time some of the original Pina Mestre Solution as put out by himself is being tried.

The recurrences to date run slightly less than four per cent. This includes indirect inguinal, direct inguinal, as well as double inguinal hernias. There has been difficulty in closing a few cases, but in only three cases have we been unable to affect a complete closure. These were cases that were injected against our first advice. These occurred in cases where there was extreme difficulty in holding the hernias reduced. One case was that of a man who was referred for surgery. He had developed a direct hernia after the closure of an indirect inguinal hernia. In this case we did not diagnose the direct hernia.

Various solutions were used in this work. The Thuja mixture, the Mayers solution and the original Pina Mestre solution. From what little observation that has been made to date of the original Pina Mestre solution, it appears to be the best of any of the solutions yet obtained. We did not use any of the Pina Mestre solution which was put out by a drug house in this country, as experimental work upon dogs showed there to be necrosis present when injected in animals.

All patients are given the following instructions.

1. The truss should be worn next to the body, removed in bed, and put on in bed.

2. Patients with large hernias should wear their trusses night and day for two weeks.

3. If the truss does not stay in position, a strap fastened in front and back will hold it in place.

4. The pressure of the pad should produce a depression in the skin.

5. If the hernia becomes painful or if you are distressed by wearing the truss, report to the clinic for examination.

6. The hernia must be held back at all times by the truss.

7. You will be able to continue your regular occupation, but if you do any heavy lifting, see that the truss is in proper position.

8. The number of injections varies from eight to sixteen.

9. The truss should be worn six months after the last injection.

10. At the end of this period return for check-up.

11. It is also well that you report for examination every six months for about two years.

12. If at any time a recurrence develops, we would appreciate it if you would return for examination, or notify us to that effect.

Conclusions:

1. It is a safe and effective method in eradicating certain types of hernias, if proper technique is used, but there is danger of complications if details are not adhered to.

2. It demands the co-operation of the patient in the proper wearing of the truss.

3. Knowledge of the fitting of trusses and the technique of the injection is absolutely essential.

4. Recurrence of hernia can very nearly be done away with by combined form of treatment.

Complications as mentioned have not been substantiated to date by clinical cases, except where hernias have been injected and there has been a definite contraindication.

It brings the mechanical treatment of hernias, where necessary, from the hands of those who know little or nothing of diagnosis, pathology and anatomy, into the hands of physicians who should know this form of treatment.



Does the Heart Fail in the Acute Infections?*

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IT HAS generally been assumed that when the pulse becames rapid, the hearts sounds become muffled during the course of severe infection that the heart has failed and various measures have been recommended to stimulate the heart. When one consults text books on Medicine or on Treatment of Internal Diseases under the sections on Infections one will invariably find the statement that the heart fails and the cardiac stimulants should be administered. First and foremost of the cardiac stimulants is always digitalis. Then come others such as caffein, camphor, sometimes strychnin. Adrenalin is now often mentioned.

The first results of infection with bacteria is increase in the body temperature. This produces increased heat production and signifies increased metabolism. In order for the body to compensate for the increased metabolism there must be more blood brought to its varying parts, hence the heart is called upon to furnish more blood. This it does by increasing its rate so the minute output becomes greater. The blood pressure may not be altered or it may be slightly lowered, due to general vasodilation. This is the circulatory response to all mild and moderately severe infections. Therapeutically one does not interfere in any way, for the body seems fully capable of restoring itself to health without active assistance. It is evident that the great majority of infections belong to this group. Venous return flow is ample to cause adequate ventricular diastolic filling and the heart is never considered to be in danger.

Now suppose that the infection becomes severe, the pulse becomes more rapid and smaller, the blood pressure drops, the first heart sound at the apex becomes impure. These are the usual text book signs of "heart failure." What is happening? Are these signs of heart failure or are they signs of peripheral failure? Is it conceivable that an organ with such a reserve power as the heart has, an organ that, given oxygen glucose and insulin, can beat almost indefinitely outside the body, an organ that beats from before birth to old age, is likely to fail within a few days? Isn't it much more likely that we shall find the explanation for the so-called "heart failure" elsewhere than in the heart itself?

For some time Experimental Physiologists have been trying to elucidate the phenomena of primary and secondary shock. The one condition common to both is decreased blood volume. This results in insufficient venous return flow so that the tissues are not oxygenated and the patients suffer from cellular asphyxia. For us the phenomena accompanying secondary shock are of particular interest. Blalock and his co-workers believe, on the basis of their experiments, that the symptoms of shock following a large crushing injury to the leg are not the result of toxic products absorbed from the injured muscle but are due to extensive transudation of fluid from capillaries which reduces blood volume. Moon, as the result of experiments, sees the reduced blood volume as the important factor, but concludes that there is a toxic action of histamine-like products from the injured muscles which damage capillaries and favor transudation. Recently Legueu and his co-workers have shown that there is an accumulation of chlorides in and about an injured part thus producing a general hypochloremia if the damage is considerable. They consider that the disturbance of molecular equilibrium produced by the abnormal distribution of chlorides explains a number of the accidents due to traumatic shock. They evidently do not accept the toxic theory as an adequate explanation. As Fleming has shown that increase in chloride favors phagocytosis, and it is common knowledge that phagocytes are attracted in great number to the injured part, it may well be that this is one of nature's protective mechanisms.

There are several important blood reservoirs or depots in the body where the blood may collect and be of no use to the body. The circulating or effective blood volume is what keeps the body going both in health and in disease. Barcroft was the first to show that the spleen in the dog was an important depot. Eppinger could show that in man the spleen was of no great importance. The splanchnic area, the liver, the subpapillary capillary plexus (Wollheim) are the three great depots. Under pathological conditions the lungs become an important depot. It is in these areas that so much blood may stagnate or so much

*Read before the Hennepin County Medical Society, December 4, 1933.

fluid be withdrawn from the blood that the total effective blood volume may be greatly reduced. Under such conditions it is easily understandable that the amount of blood available to the heart is reduced to the point where there is not sufficient diastolic filling to produce strong contractions. Starling has enunciated the law that the strength of a muscle contraction depends upon the initial length of the fibres. A muscle stretched to its physiological limit responds when stimulated with the greatest contraction. If there is no loading of the muscle contraction is weak.

The stimulus for cardiac contraction is diastolic filling or stretching of the muscle. The same law applies to the heart as to any skeletal muscle so that if there is insufficient diastolic filling which comes about by lessened venous return flow the heart beats are weaker than normal, the stroke volume is less so that in order to maintain adequate circulation the rate increases. This happens in secondary shock when the body temperature is normal or subnormal.

Parenchymatous degeneration, "cloudy swelling," is found in all the organs in all patients seriously ill with bacterial infections. The organs are larger than normal, every cell is swollen. This swelling is due to imbibition of fluid which has no origin other than from the blood. Some small amount may come from subcutaneous tissue if that has been kept filled with fluid by any means. This water of "inundation" (Cannon) is the first to be used by the body as it is in native state, not combined with any body cells. The withdrawal of so much fluid from the blood concentrates the blood and slows the circulation. Particularly does it slow venous return flow for transudation from blood vessels takes place at the capillary area or the beginning of venules. As the patient becomes more gravely ill free fluid is found in the pericardial and peritoneal cavities and the lungs show transudation of fluid even to the accumulation of free fluid into the pleural cavities. All of these fluid accumulations have their source in the circulating blood. Isn't it evident that lowered effective blood volume and hemo-concentration must occur?

Probably every one has seen the lungs from a case of influenzal pneumonia. You recall that they are enormous and are so full of fluid that they drip when taken out of the body and one can wring fluid from them like one wrings water from a soaked sponge. Underhill has actually found marked hemoconcentration in influenzal pneumonias with hemoglobin values over 140 per cent. How can the heart carry on when the blood is so viscous it can not return even to the right side in sufficient amounts? The huge edema of the lungs as the edema elsewhere, results from capillary damage and consequent increased permeability. Pathologically there are innumerable punctate hemorrhages throughout the organs and microscopically, as Moon has shown, the capillary endothelium reveals evidences of degeneration.

Naturally the conditions in the body cannot be identical with those which occur in secondary shock without infection, for infection adds the specific toxic effect of the interaction of bacteria upon tissues. However in at least one infection studied the various conditions found in secondary shock are present.

In peritonitis where the phenomena of secondary shock have been most carefully worked over in the laboratory it is found that low blood volume, hemoconcentration, hypochloremia and low blood pressure are invariably present. These can be said to be the constant signs of secondary shock. They are signs of peripheral collapse. V. H. Moon has recently shown that from the examination of tissues microscopically after death there is evidence in the tissues of peripheral collapse. So that there are both Experimental Physiological and Pathological evidence of peripheral circulatory failure.

Attention might be called to the fact that the most minute histological examination of the cardiac muscle fails to show sufficient changes to explain its apparent failure except in cases of actual specific damage as in diphtheria, acute rheumatic fever or septic emboli.

The substance apparently responsible for the transudation of serum from the capillaries of the injured part is histamine. This substance dilates and injures the capillaries at the same time it constricts the arterioles so that while collapse may be great blood pressure is not always as low as might be expected.

In infectious fevers or in infections which are severe the products of disintegrating proteins resulting from the effects of the bacterial toxins produce histamine-like substances (MacLeod) which have the same effect upon capillaries as has the histamine in lacerated or crushed wounds. In other words in patients seriously ill with infections there is lowered blood volume, hypochloremia, hemoconcentration, and therefore insufficient venous return flow. The heart attempts to keep the circulation going by more rapid beating. There is insufficient flow to the right side and, therefore, the left ventricle does not receive enough blood to distend it for good contractions. The results are well known; rapid contractions with small output at every contraction.

The condition is analogous to that in secondary shock and results from peripheral collapse not from failing heart.

In order for the heart to perform its work there must be sufficient supplies of oxygen, insulin and glucose. Recent work has shown that the delayed heat of muscle contraction resynthesizes the phosphagen, and the lactic acid produced as the result of contraction is carried to the liver and there resynthesized to glycogen. The heart muscle is four to five times as sensitive to the accumulation of lactic acid as is a skeletal muscle. It becomes poisoned, therefore, at levels of lactic acid accumulation which do not affect the skeletal muscle—Meakins, Eppinger and others have shown that in those persons dying of congestive heart failure there is marked increase of lactic acid in the blood. We can understand why such persons die even if at autopsy there is no histological evidence in the heart muscle sufficient to explain the heart failure.

In the heart during the course of serious infections there is cloudy swelling of the muscle. There is also the same condition in other organs and while the functional capacity of the various organs may be, and undoubtedly is, somewhat below normal, still the organs do function and function well. The reserve of the heart is great. Romberg and Pässler in 1896 showed that even in fatal bacterial infections in rabbits the functional capacity of the heart was good until just before death. They considered so-called heart failure to be due to peripheral circulatory collapse so that the idea is not new. Given oxygen, glucose and insulin it is practically impossible to exhaust the muscle. In an atmosphere of low O_2 tension where the O_2 is becoming rapidly exhausted the muscle soon ceases to beat.

All the nutritive substances reach the heart muscle through the coronary arteries and whether, as Smith believes, the diastolic pressure is more important for the coronary flow or, as others believe, the systolic pressure is important is not material, for the fact is that both are much reduced in serious infections. The blood supply is, therefore, reduced and with it are all the important substances required for muscular contraction. With the lessened venous return flow anoxemia tends to show itself. Anoxemia of the heart produces dilatation. With dilatation and lessened diastolic filling the heart can not last long hence dilatation is an antemortem condition. While there is still resistance in the body and even though the patient is desperately ill with rapid, small pulse and low blood pressure, the heart is probably not dilated as is so commonly taught but it is smaller than it should be, due to the lessened amount of blood reaching the ventricular cavities. The muscle is not stretched, therefore, the contraction is not strong. When the time comes that the infection is overwhelming, then the nutrition of the muscle suffers and eventually it dies, but practically invariably hyperpyrexia results in respiratory failure (Wiggers). As long as the three substances are supplied in sufficient quantities to the heart it will do its specific work. It does not fail but the periphery collapses, not enough blood is returned to the heart and the heart then secondarily fails.

It does seem unusual that an organ with such great reserve power as the heart has, should after a few days' fever, begin to fail. For years this puzzled me and it was not until within recent times that an adequate explanation for the circulatory failure was put forth. Now the apparent heart failure has a logical basis. The heart fails, yes, but it does so only after collapse and failure of the peripheral circulation.

Treatment

If the foregoing contention be true, then the drug therapy of the so-called failing heart in the infectious fevers has been of little value. Patients have recovered, to be sure, but the recovery has been in spite of, not because of, the so-called cardiac stimulating treatment. As a matter of fact, except for digitalis and its congeners, we possess no stimulant for heart muscle, and digitalis has not been proved to be a muscle stimulant in persons ill with infections. Digitalis is not a heart stimulant in the sense that it can cause the heart to keep on beating when its nutrition is at a low point and there is little blood to pump. But we are not interested particularly in so-called heart stimulants, denying as we do that the heart fails. What profoundly interests us is how is it possible to keep blood volume up and venous return flow adequate so that the body may have all the opportunity possible to combat the infection with all its reactive forces?

As far as drugs are concerned we are not very fortunate. Wollheim has shown that strychnin in sufficient dosage increases blood volume. Arkin and Fleming have shown independently that strychnin even in minute quantities has a stimulating effect on phagocytosis. Arkin found in vitro that 1/8000 per cent was active and Fleming showed that the injection of 50 c.c. of 10 per cent NaCl solution into the blood of humans raising the chloride content not more than 0.01 per cent, markedly increased the bactericidal power of the blood.

Most authors are reluctant to recommend strychnin because Pharmacologists have insisted that it is not a heart stimulant. They have lauded digitalis. It slows the heart beat (of a normal animal); it causes the heart to beat more strongly (in a normal animal); it improves the glucose assimilation of the heart muscle (in a normal animal); in humans ill with pneumonia it may change the form of certain waves in the electrocardiogram. Whether these changes mean that the heart muscle beats more strongly or not is not decided. Even if it did beat more powerfully of what use would it be to the body metabolism if the diastolic volume were greatly reduced? In toxic doses it causes the heart to go into tetanic contraction, therefore, in smaller doses it must be a heart stimulant. Unfortunately in our work as doctors we are not treating normal animals but human beings suffering with serious infections accompanied by fever, prostration, functional derangements of all the organs as the result of poisoning by bacterial products. The difference is great and it would not seem altogether logical to transfer the results of laboratory experiments on normal animals directly to the treatment of desperately ill humans.

Strychnin also stimulates oxidative processes. It is generally held now that the vasomotor center in the medulla in serious infections [diphtheria may be an exception (Porter and Pratt)] is paralyzed. Strychnin is said to act upon vasomotor and motor ganglia. I have used it for years in doses of as much as gr. 1/10 every hour for a number of doses. Maybe the patients would have recovered without it. In severe influenzal infections with complicating pneumonia Underhill and his co-workers showed that the blood was concentrated. In such cases I used strychnin along with other measures to be mentioned and saw apparently good results. Digitalis has the effect of increasing the blood in the storage depots and of lessening the volume in active circulation (Wollheim).

Other drugs which are said to be of value because they increase blood volume, are caffein-sodio-benzoate, the newer camphor preparations as Cardiazol; adrenalin and pitressin.

In infections where there are specific antitoxic sera we need not be concerned about circulatory collapse. For as soon as the bacteria are rendered harmless the circulation rights itself rapidly. We have no specific sera for most of the infections so we must keep the body going until it can make its antitoxin. The two most important conditions to combat are low blood volume and hypochloremia.

Twenty years ago when we were seeing so many cases of typhoid fever I reasoned that the heart did not fail but that there seemed too little blood getting back to the heart. I, therefore, used gravity to assist in venous return flow and at the first sign of failing circulation I elevated the foot of the bed from 10 to 12 inches. This frequently was sufficinet to lower the pulse rate and improve the pulse volume. I took a great many blood pressure readings before and after raising the foot of the bed but I never could demonstrate any significant change either in systolic or diastolic pressure. The negative results were never published. Nothing much was known then about blood volume changes, storage depots, etc., but practically it worked. Further when the pulse became more rapid and the heart tones were quite faint the legs were bandaged tightly from the ankles to the hips. I now know that by so doing one can increase the blood volume in the rest of the body by from 10 to 20 per cent. This was purely empirical treatment. This then is one method of increasing blood volume. Naturally it could not be done in pneumonia when patients are not able to lie flat in bed.

The other means of increasing both blood volume and blood chlorides is the intravenous administration of normal saline solution, whole or citrated blood, or acacia solution. One disadvantage of normal saline solution is that it does not remain long in the circulation but tends to transude out into the tissues and so increase tissue edema. As long as the kidneys are functionally active this matters little. Large amounts should be given, from 4000 to 6000 c.c. daily, combined with 10 per cent glucose. Insulin may be added to the fluid in the proportion of one unit to every three grams of glucose, or 1-2 c.c. of 1:1000 adrenalin solution may be added to the transfusion. One scarcely appreciates how much fluid is lost in 24 hours by an ill patient taking practically nothing by mouth, or being nauseated and not able to retain fluids in the stomach. A normal person resting quietly loses from two to three liters through respiration, urination, and sweating. Therefore, to give 500 to 1000 c.c of fluid daily is surely entirely too little. I am sure we have saved patients by pouring fluid into them. For example, a young woman was operated on to clear up an old pelvic infection. There was no pus in the pelvis, the operation seemed fairly simple and she was sutured without drainage. Three days later she developed symptoms of intestinal obstruction and had to be reoperated. At this time there were multiple obstructions, loops with exudate on them and one

loop which was so distended and discolored that it was thought advisable to decompress it with a tube, so a jejunostomy was done. Her condition following the operation was bad. The pulse became thready and uncountable at the wrist, there was fever, nausea, vomiting. It did not seem possible to save her. During the 24 hours she was given 12 liters of fluid, four liters by vein and the rest by proctoclysis (about 500 c.c.) and through the tube in the jejunum. It was not until this large amount had been given that her thirst ceased and her pulse became countable, slower and of fair volume. For the next 48 hours she passed urine frequently and it was noticed that her face and hands were puffy. This soon passed off. She went along for two weeks gaining strength when suddenly her temperature rose to 104° F. and within a few hours she again had symptoms of obstruction and peritonitis. The woman's condition seemed hopeless. She was again operated upon, loops decompressed and an end-to-end anastomosis in the small intestine had to be done. She was returned to her room in extremis. The blood pressure could not be measured and the pulse was so small and rapid it could not be counted. A vein had to be opened in order to insert a needle. She received 4000 c.c. of normal saline and 10 per cent glucose by vein in 24 hours. After the first liter her pulse could be counted. Following this setback she improved rather rapidly and eventually could leave the hospital. Now, a year later, she is quite well and leads an active life.

The difficulties attending the evaluation of therapeutic procedures upon ill human beings are admittedly great. No two illnesses caused by the same type of bacteria are identical and no two individuals react indentically to the same dose of bacteria. One will recover in spite of what is done for him, another will die in spite of what is done. Controls are impossible. Therefore, it would seem that the most logical methods of treatment would be those based on sound physiological and pathological principles.

I submit, therefore, that there is sufficient evidence to show that the heart does not fail in acute infections. The failure is peripheral, a collapse with low blood volume, insufficient venous return flow, low blood pressure, hypochloremia, hemoconcentration. Anoxemia of the heart muscle supervenes and death occurs. Primarily the failure is peripheral, secondarily it is cardiac.

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Vitamins: Their Present Status

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A Summary of the Literature

IF ONE may judge from the popular discussions of foods and nutrition which are now enthusiastically read by the general public, the belief prevails that researches on vitamins are new. As a matter of fact, philosophers in all ages have given thought to the nature of foods and the requirements of nutrition. Even the conception of vitamins dates back a century and a half, when James Lind, a surgeon in the British navy, matured his studies on scurvy.

The limitations of chemical analysis when applied to such complex substances as plant and animal tissues, and the great complexity of these substances, made the problem of discovering what in chemical terms constitutes an adequate diet for a mammal, one of extraordinary difficulty. It is one of the great triumphs of chemistry that we are now able to explain the nature and course of a number of specific kinds of malnutrition resulting from the restriction of either man or animal to certain kinds of foods. For the past 25 years more and more scientific evidence has been accumulating, not only for the control and cure of specific diseases by the various dietary factors recognized as essential, but also for the control of the general well being of the individual and maintenance of normal nutrition.

Vitamins Defined

The term "vitamin" is a group name for substances other than proteins, fats, carbohydrates, and salts, which occur in minute quantities in natural food materials. They have been found to be essential for normal nutrition and to be responsible for the prevention of various pathological conditions known collectively as "deficiency diseases." At present there are six independent vitamins the existence of which has been definitely established.

A Little History

The history of vitamins goes back to the old-time sailing vessels, and to the scurvy from which their crews suffered. It was pointed out as early as 1747 that scurvy could be prevented if the sailors were given lemon juice or orange juice. About 1800 the frequency of this disease in the British navy was greatly lessened when lemon juice became a part of the regular ration. Thus it was proved that scurvy results from a lack of some substance which can be supplied by lemon juice. The next chapter in the history of vitamin deficiency concerns another disease, beriberi, which also accompanied the restricted ration of the sailor. This disease was the scourge of the Japanese navy until 1895, when following the advice of Takaki, barley was substituted for a part of the polished rice which heretofore had formed the chief ration. By this simple change the Japanese brought about the almost complete disappearance of beriberi from the navy. Later, Eijkman described an illness in fowls similar to beriberi, and expressed the view that this disease is due to some hitherto unknown nutritive substance present in rice polishings, to which disorder he gave the name "nutritional polyneuritis." It was found that the substance in question is soluble in water and that it belongs to none of the well known groups of foodstuffs. Dr. Casimir Funk, of the State School of Hygiene in Warsaw, Poland, made the first chemical study of vitamins in 1911. Many historians are willing to give him the major credit for having isolated this body. He coined the name, calling it "beriberi vitamin." He attributed pellagra, scurvy and rickets as well as beriberi to vitamin deficiency. To Funk is due the credit of bringing into the limelight this important question of deficiency diseases. In an attempt to reproduce beriberi in guinea pigs by means of polished rice, Holst and Frohlich found that instead of developing this disease the animals exhibited the characteristic symptoms of scurvy. Further experiments revealed the separate identity of the antineuritic and antiscorbutic principles, and indicated that both were lacking from this diet.

Vitamin Data

This important subject of vitamins is an unfinished chapter, and much that has been written will no doubt undergo revision. Attempts have been made to give these vitamins names which are suggestive of their physical properties or their physiologic action, such as "fat-soluble," "water-soluble," "antiophthmalmic," "antineuritic," "antiscorbutic" or "antirachitic," but in the light of our present knowledge it seems best to adopt a

simpler terminology—one which does not commit one to a premature description of physiologic action. The vitamin related to growth is called "vitamin A;" to beriberi, "vitamin B;" to scurvy, "vitamin C;" to rickets, "vitamin D;" and to gestation, "vitamin E."

Dr. Oscar W. Bethea, in the International Medical Digest, 1933, gives to general physicians a practical outline about vitamins which is briefly as follows:

Vitamin A

Found in: Mother's milk, cow's milk, butter, cream, eggs, orange juice, green vegetables, carrots, pumpkins, yellow squash, yams, tomatoes, whole wheat products, liver, cod liver oil, and halibut liver oil.

Not usually affected by moderate heat, but sometimes impaired. Milk and green leaves are best taken raw.

May affect: Growth, stamina, nervous stability, resistance to infectious diseases, xerophthalmia, keratinization of skin and other epithelial structures, disturbances in the alimentary tract, sclerotic changes in the nervous system, impairment of vision and probably sterility.

Vitamin B (sometimes called B_1)

Found in: Outer coating of rice, whole wheat and other grain products: beans, peas, lentils, lettuce, raw cabbage, spinach, tomatoes, liver, eggs and yeast.

Not usually affected by moderate heat. Green leaves are best taken raw.

May affect: Beriberi, polyneuritis and other diseases of the nerves; growth, sterility, alimentary disturbances (especially appetite and digestion) and degenerative changes in the heart.

Vitamin C

Found in: Lemons, oranges, limes, apples, berries, tomatoes and many other fruits; carrots, lettuce, cabbage, spinach, potatoes, milk and rare meats.

Cooking does injure. Fruit and green leaves are best taken raw.

May affect: Scurvy, teeth, gums, mental and physical efficiency; and hemorrhagic tendencies.

Vitamin D

Found in: Cod liver oil, halibut oil, eggs and cream (in small amounts). Activated by sunlight and artificial ultraviolet rays.

Moderate heat does not affect.

May affect: Calcium and phosphorous metabolism, rickets, tetany, osteomalacia, malformation and deformities of bone; teeth and general asthenia.

Vitamin E

Found in: Lettuce, cabbage, watercress and many other green leaves; whole grain, vegetable oils, yeast, lean meats and animal fats.

Not affected by moderate heat. Green leaves are best taken raw.

May affect: Fertility, nervous stability and growth.

Vitamin G (sometimes called B_2, also P. P.)

Found in: Yeast, liver (and liver extract), rare and lean meat, milk, eggs, carrots, beans, peas, tomatoes and whole wheat products. (Citrous fruit juices, especially lemon, while poor in vitamin G, often may be taken with meals with marked benefit.)

Not usually affected by moderate heat.

May affect: Pellagra; various cutaneous, gastro-intestinal, brain and cord conditions.

For the patient or family desiring instructions as to how to meet the general requirements of an individual case or of the home, where no special feature must be considered, it has been my custom to give the following:

Emphasize in diet:

Fresh milk and milk products.

Fresh fruit, especially lemons, grapefruit and oranges.

Fresh raw lettuce, cabbage (slaw) and tomatoes.

Cooked fresh beans, peas, carrots, spinach, yams, pumpkins, yellow squash and yellow corn.

Whole wheat bread and cereal, rye bread and oatmeal.

Medium done or rare liver, steak, beef roast, veal and mutton.

Soft fresh eggs (or raw as in egg malted milk).

Characteristics of Avitaminosis

In case of the rat an excellent description of the common sequence of symptoms in A-avitominosis has been given by Gudjonsson:

The first sign of this condition to be noticed by a trained eye is that the hairy coat is no longer as smooth as it should be in a normal animal. At the same time the rat begins to become emaciated; it grows lean and wastes away in flesh. Its lines are no longer soft and curved as they are normally in a healthy rat. The rat is no more as agile as it used to be; its movements are no longer marked by the creeping suppleness that is so characteristic of the rat. Its movements begin to be inco-ordinate. The silky feet with the pink soles become rough and scaly, skinny and bony. The tail is thinner and the caudal vertebrae are left as sharp edges under a paper cover. The rat begins to be negligent of cleanliness. There are remnants of food smeared about its mouth, sticking between its teeth; there are crumbs between its toes. Its

eyes begin to be less protruding and apparently smaller. The voice becomes hoarse; complete aphonia is not infrequent. Other particular signs are rare in the first stage of A-avitaminosis. By this time the rat has grown accustomed to the diet, and intestinal irregularities are extremely rare. Then comes the clinical manifestation of xerophthalmia. Often the lesion progresses at a surprising rate. One day, perhaps, there may be noticed a little bit of sanguinolent secretion in the inner canthus, and it looks as if there are fewer cilia in the eyelashes (the cilia are sticking together). The next day, one may find copious secretion, serous, purulent or sanguinolent; the eyes are almost shut, and the cornea is beginning to become opaque. The conjunctiva is injected and inflamed. In two or three days there may thus have developed a suppurative panophthalmia. The eyelids are swollen and almost glued together with purulent matter.

The characteristic ophthalmia just described is not limited to the albino rat. It has been observed to occur in a variety of other species, including man, when there is a shortage of vitamin A in the rations. For some time mice were supposed to be somewhat immune to xerophthalmia due to dietary deficiency, but this species also has recently been shown to succumb with characteristic symptoms of eye disorder to lack of vitamin A.

Particular interest has been centered latterly in the evidences of respiratory infections consequent on a dietary deficient in vitamin A. Thus, observers have reported "a nasal or bronchial catarrh or even pulmonary infection with mucous or purulent exudate, at times even resulting in hemorrhage."

Vitamins in Daily Diet

We are probably too prone to think of vitamin deficiencies in terms of definite disease. For example: Lack of vitamin B—beriberi; vitamin C—scurvy; vitamin D—rickets, and vitamin G—pellagra. As a matter of fact, the overwhelming majority of cases are of mild grade and do not reach the point of being differentiated by a definite disease name, the individuals being affected in most instances only to the extent of some impairment of their state of well-being. Many have their symptomotology overshadowed by some other pathologic process, or the vitamin deficiency may be only a predisposing or a contributing factor.

We have been too much accustomed to consider only calories and digestibility when ordering a diet. We have waited to introduce the consideration of vitamins (and iron, calcium, etc.) until we were confronted with demonstrable bony changes, the "three D's" or other pathognomonic evidence. We have used diet rather as a hand-organ on which to grind out a few familiar tunes than a master pipe-organ by means of which we may render a whole repertoire of symphonies. Let us consider the possibility of dietary deficiencies where the child is not developing into his full mental and physical possibilities, when the school girl is not making the grade or the boy not rating the team, when the mother reaches the close of the day abnormally tired or father finds his grip on affairs increasingly difficult to maintain.

Musser emphasizes the frequency with which vitamin C deficiency may cause other than the definite disease—scurvy—and states that it may be manifested merely as a condition of poor health in babies, as mental sluggishness in adolescence, or as a tendency to hemorrhage and general weakness at any age.

Brown and Tisdall have emphasized the necessity for a sufficient intake of all vitamins to insure proper growth and development. Barborka feels that care of the individual from the standpoint of vitamin intake should begin in utero. Eusterman and Wilbur have further stressed the special need of an adequate vitamin A intake during the period of rapid growth in children and feel that it is not only prophylactic against infectious diseases but also has a curative value. Mendel suggests that this protection against infection is due to the action of vitamin A in preserving the physiologic integrity of epithelial structures and in tending to maintain a general state of health and vigor. Eusterman and Wilbur also speak of its protecting by developing physical stamina, efficiency and a general ability to resist infectious diseases.

All of the recent clinical studies in the use of vitamins tend to establish the fact that their field of usefulness is broader than was at one time suspected. Typical of such studies is that of Cowgill who stresses the value of vitamin B in preventive medicine, its importance in promoting the normal growth of children and its influence on appetite. He quotes an experiment where, in a group of feeble-minded women, it was possible to increase the voluntary food intake 500 per cent by the use of vitamin B alone. Kruse and McCollum, in explaining the loss of weight due to vitamin B deficiency, give the following sequence of events: (1) vitamin B shortage, (2) anorexia, (3) reduced food intake, and (4) loss of weight. The foods containing this principle are so many, so palatable and so easily obtained that therapeutic possibilities are quite intriguing.

Egg Yolk—Rat feeding experiments and clinical work with children both have demonstrated that egg yolk is an excellent source of vitamin D.

Hess has protected babies from rickets during the winter months by the addition of egg yolk to the milk formula, and other physicians have even been able to cure severe cases of rickets by feeding one or two egg yolks daily.

Variations in Eggs—Egg yolk, however is no more a uniform product than is cod liver oil, and the diet of the hens and the amount of ultraviolet radiation which they receive are both important factors in determining its vitamin D content. For example, in one instance it was possible to increase the antirachitic potency of the egg tenfold by the irradiation of the hens, and in another the addition of a small amount of cod liver oil (two per cent of the ration) resulted in a five-fold increase in potency.

The suggestion has been made that poultrymen and consumers alike should recognize that the conception that "an egg is an egg" is a mistaken one, and that an adequate ration may yield impoverished eggs as well as impoverished animals. Eggs could well be graded on their vitamin content (judged by the ration and management of the layers) as well as on their appearance, size, freshness, and so forth, and such eggs might be demanded especially by hospitals and for infant feeding.

Stability of Vitamin D in Egg Yolk—The vitamin D in egg yolk appears to be remarkably stable. Cooking the eggs, even "hard boiling" them does not destroy their potency, nor does "cold storage" for six months at 40 F. in an electric refrigerator. Even the Chinese method of preserving duck's eggs did not seem to destroy the antirachitic value of the yolk.

Cows Milk and Butter—Butter fat, although a good source of vitamin A, contains relatively little of the antirachitic factor. In early investigation carried out by Jones, Steenbock and Nelson the samples of butter examined showed only about one two hundred and fiftieth as much antirachitic potency as the particular samples of cod liver oil tested, although the ratio of vitamin A in the two was 1 to 20.

Other samples of spring and summer butter assayed in England by Coward contained only from 0.8 to 1 unit (British Medical Research Council) of vitamin D per gram, as compared with from 50 to 150 units for cod liver oil. Thus the cod liver oil was between 50 and 185 times as potent as the butter tested.

London milk examined by the same investigator in the late fall contained practically no vitamin D, but in the following summer it had a value of 0.2 unit per gram. The summer milk, therefore, contained approximately 50 units per cup, or 200 units per quart, a small but appreciable quantity.

The seasonal differences in the antirachitic potency of milk and butter which have been observed by numerous investigators apparently are due to variations in the cow's ration and not in the amount of sunshine it receives. In a long series of very careful experiments which have been carried out at the University of Wisconsin it has been impossible to observe any increase in antirachitic potency in milk from cows which have been exposed to sunshine or which have received intense irradiation with artificially produced ultravioled rays. Potency could markedly be increased, however, by the addition of cod liver oil or irradiated yeast to the cows ration.

Other investigators have confirmed the results with irradiated yeast and have also obtained similar results with irradiated ergosterol. According to these later reports, it is possible to increase the vitamin D content of butter from fourteen to sixteen times by feeding either irradiated yeast or irradiated ergosterol.

Of the three sources of vitamin D in the cow's ration, the choice seems to be irradiated yeast. Cod liver oil is absorbed to a slight extent only by the cow, whose digestive tract is not adapted to handling such large amounts of fat and, for some reason which cannot be explained at present, better results are obtained with smaller quantities of irradiated yeast than with irradiated ergosterol.

The feeding of a standardized irradiated yeast to milking cows may therefore be considered as a practical measure for the protection of a milk of standard antirachitic potency.

A Few More General Observations

Considerable work is being done to determine the effect that sterilizing, cooking and preserving may have upon the vitamin content of foods. While much remains to be accomplished in the way of investigation, many facts have been brought to light. Hess has demonstrated that it is often not so much a matter of heating as it is of subjecting the material to oxidation, and that in a great many instances if sufficient care be exercised in this particular, food can be preserved and kept indefinitely without material impairment. In a general way, however, there is a tendency to vitamin loss upon heating. Milk, for example, in the process of pasteurization, loses from one-third to one-fourth of its vitamin C content. As previously stated, vitamin deficiency may cause definite disease processes, may give rise to a less definite symptomatology or may be a contributing factor only. Minot and Castle in studying secondary anemia found that often it was directly related to a lack of vitamin C, and in both the

prophylaxis and the treatment of this disease they urge attention to diet with such possibilities in view. Davies is convinced that the development of the simple anemias is favored by diets poor in meat and vegetables and that they are often associated with hypochlorhydria. Mettier, Minot and Townsend found that food rich in vitamin C could rapidly affect erythropoiesis in conditions related to vitamin deficiency, such as scurvy and pellagra. Conner, working on the treatment of pernicious anemia, has concluded that a diet rich in vitamins, especially A, B, and C, has distinct therapeutic value. Professor and Mrs. Mellanby have done much interesting work in showing the value of vitamins A and D in the development and preservation of teeth. This most important and interesting field of investigation has challenged the interest of many able scientists.

Investigation is still proceeding in the study of vitamin D, and there have been some interesting developments such as the demonstration that the quantity of vitamin D in milk can be increased as much as fifteen times by feeding irradiated yeast to cows. The whole question of the use of irradiated foods may be considered as being still in rather an experimental or uncertain stage.

Much has been accomplished in recent study of vitamin E, which has contributed to the accumulating wealth of material on the growth-producing agents. Browning emphasizes the fact that it affects not so much the early as the later growth of animals and that no satisfactory explanation of this effect has yet been offered.

Underhill made the interesting statement: "The allocation of vitamin G as the sole factor in pellagra is not well established and too much reliance should not be placed on this agent in the prophylaxis and treatment of pellagra." Let me remind you again of our lemon juice. Roberts found that pellagra occurred principally among his lean patients and that the obese individuals developing pellagra were rare. He feels that the fact that a patient gives a history of having sat at a good table does not necessarily mean that he has actually eaten a well-balanced diet.

Musser estimates that only 10 or 15 per cent of pellagrins actually come under the care of a physician. Underhill quotes DuBois as finding a large incidence of pellagra among chronic alcoholics, particularly among that class which may subsist for a long period of time on such a regimen as whiskey, coffee and doughnuts.

Observations attempting to connect the diet of the mother and rickets in the babies are somewhat contradictory and difficult of interpretation. However, a recent study of a group of colored babies at Johns Hopkins Hospital does indicate that when cod liver oil is given to a mother a certain amount of antirachitic vitamin passes into the milk. In this study, forty-seven infants were observed, the mothers of nine of whom had no cod liver oil, while the remaining thirty-eight had been taking three teaspoons of cod liver oil daily from the birth of the baby until it was six months old. No cod liver oil was given to any of the babies. Although individual cases showed wide variation in the extent of rickets regardless of the cod liver oil, the average extent of rickets as judged both roentgenographically and by calcium-phosphorus content of the blood serum varied inversely with the amount of cod liver oil taken by the mothers (Weech).

Irradiation of the mother, too, has been found to give encouraging results. A woman whose milk had been very low in vitamin D was irradiated for a month with a quartz mercury lamp. The antirachitic potency was decidedly increased as shown by the increased serum phosphate and marked calcification of the epiphyses of experimental rats to whom the milk was fed. Interesting and important though these results are, the bets way to protect a baby seems to be to give cold liver oil or the irradiation to the baby direct, rather than to the mother.

Toxicity of Vitamin D

One of the earliest investigators designed to demonstrate the effects of large doses of vitamin D was that of Kreitmar and Moll of the research laboratories of E. Merck and Company, in Germany. In the course of this investigation it developed that exceedingly large doses, from 10,000 to 100,000 times the minimum protective dose, caused a rapid loss of weight, followed by death within a short time, not only in white mice and rats but also in guinea pigs, rabbits, cats and dogs. All these animals presented the same picture of definite and severe disease—loss of appetite, rapid loss of weight, severe emaciation and decided decrease in vigor. Often a diarrhea developed, and the hair became rough and shaggy, and took on a greasy appearance. Death followed in varying lengths of time for different animals, from an average of ten days for the rabbit to thirty-six days for the guinea pig.

After death, enormous deposits of calcium were found in the walls of the blood vessels and of the vital organs, evidence that calcification had been stimulated to the point at which the mineral was deposited in any and all tissues which would receive it, whether or not it was needed or even useful there.

Further work by other investigators has shown

that very often the blood calcium or phosphorus or both are raised much above normal levels. The excretion of calcium and phosphorus shifts from feces to urine, and the mineral balance, which is at first increased, may later be greatly decreased or may become strongly negative, indicating a loss of calcium and phosphorus from the body as a whole. In advanced stages of intoxication the mineral content of the bones may be considerably below that of normal animals.

Some Foods Without Vitamin D

Vegetables—Vegetable foods, even the green vegetables so rich in Vitamin A, are ordinarily lacking in D. Hess reports in an early article that spinach, green or yellow lettuce, or green wheat added in large quantity to a ricket-producing diet could not cure or prevent rickets in rats. An extract of dried spinach is even used in animal experiments when a source of vitamin A is desired entirely free from D. Other investigators since then have been able to demonstrate very slight antirachitic properties in cabbage and in fresh spinach, especially grown in the open during the summer months. Without a doubt, however, the idea prevalent before the distinction had been drawn between A and D that vegetables had marked antirachitic potency has to be abandoned. In view of the facts to be reported on antirachitic activation of foods by exposure to ultraviolet ray, it seems somewhat surprising that vegetables grown in sunshine should have little or none. The explanation may lie partly in the relatively small amount of ultraviolet ray in the sunshine and partly in its slight penetrating ability, "so that plants, unprovided as they are with any system for the translocation of lipoids, cannot be affected to a high degree."

Yet the old adage to "make hay while the sun shines" seems to have at least slight dietary significance, for, according to Steenbock and Hart, clover hay dried in the sun, without exposure to excessive weathering, had considerable antirachitic potency while dried in the dark, though a fine green color, had none.

Vegetable fats, too, are not antirachitic. Bills had shown the lack in cottonseed, linseed, maize (from white maize), olive, peanut and cocoanut oils, and in hydrogenated cod liver oil.

Standardization of Irradiated Ergosterol, and Cod Liver Oil

The American Unit—In the United States the Council on Pharmacy and Chemistry of the American Medical Association has accepted the rat unit proposed by the Wisconsin Alumni Research Foundation (Steenbock) for the standardization of irradiated ergosterol. This unit is defined as "that amount of vitamin D which, when uniformly distributed into the standard vitamin D deficient diet—ration 2965, J. Biol. Chem. 64:263, 1925—will produce a narrow and continuous line of calcium deposits on the metaphysics of the distal end of the radii and ulnae of standard rachitic rats." In this instance the line tests and the Steenbock diet are taken as standards.

Viosterol (irradiated ergosterol) is standardized by comparison with a "potent cod liver oil," which is defined as one that contains 13.33 rat units per gram, or one rat unit in every 75 mg. of oil. This 75 mg. of oil, it should be noted, does not constitute the minimum daily dose but is the total quantity of oil to be given during the entire period of the experiment, from six to ten days, the exact length of the period depending on the food consumption of the individual rats.

The British Medical Research Council objects to the standardization of irradiated ergosterol in terms of cod liver oil because of the variation in potency of different samples of the oil and because of the variation in response to equal doses of any antirachitic material that may be shown by apparently similar animals when tested at different seasons of the year or bred in different laboratories.

In Germany the unit used by Windaus and his associates and by the firms dispensing Vigantol, the German equivalent of viosterol, is defined as that amount of active substance which exactly suffices to protect, with certainty, the growing rats from rickets.

Does Our Dietary Require Vitamin A Supplement

In a recent paper under the above title Hess, Lewis and Barenberg come to the following conclusions:

Forty infants were given large amounts of carotene daily, forty were given large amounts of haliver oil and eighty no vitamin A supplement; all likewise received viosterol. In the course of an observational period of five months, frequent respiratory infections developed in all three groups, among these receiving vitamin A to the same extent as among the control group. Pneumonia and otitis media were not prevented. The blood in the carotene cases was saturated with the provitamin, as indicated by marked carotenemia. There is no clinical basis for considering or designating vitamin A the "anti-infective vitamin."

The addition of cod liver oil to the dietary did not reduce the number of respiratory infections occuring during the summer months.

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Eyes and Vision in College Students from the Standpoint of an Eye Doctor*

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ONE may well ask, "Is there any important difference between the eyes and vision of college students and other people?" and second, "What can an eye doctor do to help the college examiner?"

My reply to the first question, "Is there any important difference," would be an emphatic "No." This is obvious of course in the case of graduate and post-graduate students of large universities, such as say Columbia and Chicago, where thousands of teachers attend each summer. The eye question is *then* just that of the rest of the intelligensia of the community. But is not this also true of the undergraduates? There are some differences but they are not especially important. By and large the college student has neglected his health. His average father and mother have made considerable sacrifice to send him to college, and medical costs have been cut along with everything else, not just lately, but always. So he comes to college with teeth, eyes, weight, clothes, pocket-money, etc., leaving something to be desired. But are these differences important? No. Again, a good many students have really studied hard before they come and continue to do so. Does this set them aside from the rest of the population? No. Well, then, why talk at all? Because the *general* eye and vision problem warrants thought and discussion. You are a deeply interested group; a very important group in my opinion, one I would like to influence.

My contention is that the importance of eyes, vision, glasses, etc., are all much exaggerated, overdone, over-emphasized, at the college level and everywhere else.

In the first place, the average person has much more of eyes and vision than he needs or uses. Perfect eyes and vision are not the *sine qua non* essentials that we think they are. I know a number of individuals who are giving a better account of themselves now on next to nothing in the matter of vision than they did with their relative ocular affluence. I know a high school teacher, blinded at 57, who has been much more productive, and who, I think, has enjoyed life more since he went blind 12 years ago. I know a girl who lost over 19/20 of her vision at 12, graduated at Oak Park (Illinois) High School, The University of Chicago, and the Perkins Institute for the Blind at Watertown, Mass., and now at 28 is a teacher of the blind at Pittsburgh. This girl is socially adept and with less than this 1/20 vision she attended a formal dinner party with my wife and I myself, and with two other eye doctors and their wives, in Boston a while back, and none of the women noted her handicap! A fourteen-year-old Syrian girl patient of mine, with even less vision, is making normal educational progress in the Chicago Public Schools, as are 330 others here in Chicago, with less than half vision in their best eye.

After 35 years in eye work the most pitiable thing I see daily is not the tragedy of blindness, but the failure or inability to accept an unimportant visual handicap, a moderate visual deprivation, with needless apprehension and fear of blindness. Over half my consultation hours are spent trying to do away with this needless, useless, pitiable apprehension, especially in parents. Fear indeed is a frightful thing. The negro of the South fifty years ago was ignorant but perhaps happier than today. "Ignorance is bliss"—relatively, certainly, in some instances. The good eye doctor does not inform his patient of his incipient cataract until he has to.

One may ask: Is there more needless fear about eyes and vision than about other things? Yes, more than about most things. True we have much unwarranted fear of cancer, tuberculosis, syphillis, old age, etc., but fewer people fear these things than fear the loss of their vision.

Why is this? If I ever write a novel, it will center around the idea that, after our sex, our subconscious life is more dominated by our vision impressions than by anything else. We say "seeing is believing;" rather I would say: We see almost nothing we look at, we are almost regularly deceived by it, and our subconscious self distorts, perverts, ignores it and we remain (not sublimely) oblivious to what it really is. We try to make it what we want it to be; we would rather guess at it than give it purely careful objective observation. Instead of saying we

*Read before the fourteenth annual meeting of the American Student Health Association, Chicago, December 29, 1933.
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believe what we see, it would be more exact to say we distrust what we see.

How does this fear come about?

When a child is born it has no conscious vision or hearing or sense of smell. All the child responds to is its hunger. It knows its mother's breast and its warmth. Can one imagine the child's impressions when say, the fond father insists on forcing his attention on the child? When he does eventually attract the child's attention and the child gazes at him and thus gets his first real visual impression, what must be the child's impression? Can this grinning, gesticulating apparition cause other than the most bizarre, startling, disconcerting, fear-compelling impression on the child? Possibly this is no more disconcerting to him than it would be to us if this floor should suddenly open up and a strange monster appear in our midst, spouting fire and making strange noises, incomprehensible to us. Possibly our first visual impressions come about this way and, associated with fear, fix our attitude toward all visual impressions for the duration of our lives. No one knows.

Discussion

Following Paper by Dr. E. V. Brown

DR. H. C. GEBHART, University of Illinois

I have been much interested in Dr. Brown's paper because the attitude that he has developed through years of dealing with the finer points of visual derangements is considerably at variance, in some respects, with the view taken by one who spends a great deal of time in merely advising students who have obvious visual defects. I would agree that it is not a good procedure to lay stress upon any type of physical disability and thereby unduly impress the occasional neurotic person with the importance of the defect. However, it seems to me that many students are seriously handicapped in their attempts to successfully pursue a course of study because they have some remedial defect in their vision. I would not disagree with the contention that the eye problems of the student are not radically different from the eye problems of the rank and file of the population. Nevertheless, the student in college often fails to do himself credit because, I believe, he is somewhat more dependent upon acceptable vision for success than is true of people in many other occupations.

There are certainly some people who succeed in spite of handicaps, visual or otherwise, but I do not believe that these exceptions make the task any easier for the average. We find that more than 40 per cent of the students who come to the University of Illinois at Urbana have some inadequacy of vision. Many of these are so slight as to be negligible or at least that would be the impression when they are first examined upon entrance to the University. But within the first two years of their college course, and in many cases, within two months after beginning, 10 per cent to 15 per cent of this group return to us with symptoms that are directly traceable to their lack of adequate vision. The direct result of this condition and the thing that brings most of them back is the apparent fact that they are unable to successfully compete with their fellows in the classroom. We have no way of knowing how many with such defects do not report but it does seem that proper examination and properly fitted glasses solve the problem satisfactorily for most of those who do report. I feel that many small physical ills that may actually grow in severity or may affect the mind of the victim to the point of an actual neuroses may, when taken early, be overcome by some comparatively minor type of procedure. Visual defects in students are, in my opinion, one of the most important of this group of ills.

Vitamins: Their Present Status

(*Continued from Page 252*)

Infections of the skin, impetigo, developed in the vitamin groups quite as often as in the control group.

Inquiry throughout the United States disclosed that nightblindness, the most delicate index of deficiency of vitamin A in the adult, is a very rare disorder and has not increased during the past few years.

Our dietary is not deficient in vitamin A. A lack may come as the result of vagaries of diet or when absorption is defective; for example, in diarrhea or jaundice.

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Should the Development of Facilities to Remedy Physical Defects at Special Student Rates Be Carried On?*

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AT THE University of California it has been our practice for many years past to endeavor to correct defects that were discovered at the time of the entrance physical examination. These included hernias, varicoceles, hydroceles, fibroids of the uterus and tumors generally, chronic enlarged tonsils, etc. There were also chronic infections, such as osteomyelitis, tuberculosis, sinus infections, bone and joint deformities, and the paralytic conditions following polio cases, and lastly congenital defects, such as pilonidal cysts, undescended testes, etc. Now it would seem that during periods of financial depression the caring for these students would assume a greater importance.

Our University budget was cut five million dollars this past year and consequently every departmental budget has been reduced accordingly. Plans were, therefore, instituted to meet our situation. The last fiscal year, July 1, 1932 to June 30, 1933, we had an enrollment of 15,873 students at Berkeley. Of this number 1,778 were confined in the hospital for an average of five days. The Health Service treated at the Dispensary 11,460 students, or 72 per cent of the pensary 11,460 students, or 72% of the student body. The treatments given numbered 89,527.

It is of interest to note that the number of major and minor operations for which a fee was charged totaled 410. These consisted of acute, chronic and congenital types, 103 being abdominal operations with 73 appendectomies. There were also any number of minor cases of surgery performed gratis. The amount of surgical fees collected amounted to $17,820.37 with an overhead cost of $8,380.02. In the Dental Department the fees collected amounted to $9,871.50 with an expenditure of $8,106.06.

In our Health Service and Hospital we formerly accepted the congenital and chronic surgical cases and operated upon them at a special rate. For instance a hernia, mastoid or other major operation was performed for a fee of $75.00 plus an anaesthetic charge of $5.00. Tonsils, haemorrhoids, and other minor surgery was charged for on a sliding scale ranging from $20.00 to $50.00. These fees covered operating room service, anaesthetics, X-rays, biologics, laboratory service, dressings, drugs, etc., besides unlimited hospitalization and general nursing. No further charge was made. This year we decided that these types of chronic surgical cases were essentially cases for their own home physicians, on the grounds that the students were possessed of these defects before entering College. Each student is informed of his defects at the time of the entrance examination and advised as to the risks incurred, palliative measures, surgical or otherwise, are suggested, and the case observed. Should a fibroid begin to bleed or a hernia become strangulated, the case is then considered acute and surgically treated. All acute abdomens, such as appendicitis, gall bladder, stones in the kidney, etc., are admitted as usual under the old terms of admission.

The present system (1933) has, in our estimation, proven successful. It has cut down the days of hospitalization. Incidentally it has enabled us to function within our leaner budget and at the same time offer our students a good measure of service. Furthermore it will prevent certain students from coming to the University specifically for treatment, or to be operated upon. A chronic case, as for example, osteomyelitis, when operated upon must be hospitalized for weeks and months, and a student under these circumstances is compelled to give up his college work and become a patient under the University's responsibility instead of his parents'. Whenever a member of the staff recommends an operation of this type to a student or persuades him to undergo same, and the operation is unsuccessful, or a fatal termination ensues, the doctor places himself and the college in jeopardy. Should any adverse conditions arise, legal entanglements and suits are likely to follow. Not only is the physician's reputation at stake, but he would also be liable to condemnation from the students and their friends. Today is a day of "rackets" and we should avoid unnecessary procedure that might lead up into difficulties. Personally, I speak from experience, having defended two such suits. Remember, a State University cannot be sued, as "the King can do no wrong," but the Director, the Surgeon or both may be sued.

*Read before the fourteenth annual meeting of the American Student Health Association, Chicago, December 29, 1933.
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On the other hand should a student be stricken with acute appendicitis or mastoiditis, he is advised to have immediate surgical care. This presents an entirely different picture, and the dangers are shared alike with the surgeons and the parents. In our institution we accept all kinds of acute surgical cases. We do not charge for traumatic cases, such as fractures, dislocations, burns or wound, these patients receiving hospitalization, surgical care, physiotherapy, X-ray and appliances, gratis.

Certain defects which must be considered in the acute class are often found at the time of the physical examination. To follow out the line of preventive medicine and to insure good results these cases must be taken immediately. A concrete example of this type is a small mass in the breast which should be removed as soon as discovered. Such a procedure is a principle of malignant disease prevention and therapy, which should be advocated and followed up accordingly.

In our dermatological clinic which is held on two mornings a week we see about 80 patients. Many of these students apply for the removal of certain defects which are disfiguring in nature, such as superfluous hair, moles, keratoses, scars, etc. These may require surgery, cauterization or X-ray methods of therapy. Are these superficial defects an obligation that the Health Service should assume? We all agree that such moles as might eventually develop into a malignancy should come under preventive surgery, and the plantar and the so-called seed warts, which are infectious, are to be treated as any acute infectious malady.

Dentistry is an auxiliary specialty in Medicine, and every college dispensary, no matter how small, should have a part time dentist on the staff. In our dispensary we have one full time and four half time dentists. The services are confined to emergency dentistry: extractions, filling of teeth, and dental hygiene, for which a fee of $2.00 per hour is charged. The dentists also treat cases of Vincents disease, and perform such dental surgery as is called for as in the case of fracture of the mandible. The type of service performed is in line with preventive medicine as the removal of dental foci of infection is essential in maintaining health.

Now as to the defects that belong in the category of Internal Medicine: In our service we have developed facilities to remedy or adjust serious conditions, the application of which enables certain types of chronic cases to carry on. The student can be placed in the best physical condition possible, thereby enabling him to pursue and accomplish the education he seeks. I refer to such medical cases as diabetes, nephritis, stomach ulcers, etc. We are accepting these students as ambulatory boarders in a special dining room provided at our hospital, the rate being on a par with that charged by fraternity houses. These patients are under the supervision of an internist who has carefully examined each one, and all the necessary laboratory work has been performed. In the case of a diabetic, the amount of insulin is prescribed and the patient taught how to administer it. The dietetic prescription is followed out by the dietician and the cases followed up at intervals. This is one of the newer advancements in student health administration and has proven a great success.

Then there is the constant struggle with the underweight and overweight students, the question as to whether those in the former group are under-nourished or possess some malnutrition complex due to incipient pathology. It is in this group that X-ray examinations frequenty reveal early tuberculosis. In the overweight individuals the application of endocrinology, diet and exercise affords results. These are the cases that require much time and labor on the part of the Dispensary staff, and which must be considered as part of the day's routine.

Our foremost duty is constantly to keep abreast of the develoments in preventive medicine, to use all known methods of immunization without charge, and to encourage students to present themselves at the dispensary for all minor illnesses and injuries.

To my mind the keystone of practical preventive medicine is to be able to treat patients before grave pathology ensues, thereby lessening morbidity and mortality. It should be our most important endeavor to control and treat all infectious diseases, whether medical or surgical, including venereal, dermatological and respiratory diseases. For this express purpose Colleges should attempt to finance a health service enabling such a program to be carried out without additional cost to students. Whenever a case presents itself that does not fall in the acute class but which requires an operation or special medical attention, the patient should be referred to the director of the health service. The director must decide from a social service standpoint the best course to adopt. In the case of destitute students he would recommend to the President the annulment of their bills, and attempt to alleviate by professional skill those ills or defects that seriously impede their progress in college.

Physicians in general, during depression when

(*Continued on Page 364*)

Surgery in Diabetes*

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Oakes, N. D.

(*Continued from Page 316, June 1 Issue*)

Local anesthesia with novocaine does not produce acidosis. However, it should not be used for infiltration of the operative field in the diabetic as it is likely to injure the tissues and interfere with the sluggish blood supply and cause a slough or retard healing.

Regional anesthesia is a form of local anesthesia but the anesthetic is injected not directly into the field of operation but into the region of the nerves that supply the operative area either by field block or nerve block. To employ regional anesthesia in a great variety of conditions requires a thorough knowledge of anatomy and much experience. It reduces the danger of injury to the organs of the body as the kidneys, liver, lungs, and heart with their resulting post-operative complications, does not disturb body chemistry and is therefore an ideal anesthetic for the diabetic.

Affections of the Lower Extremities in Diabetes

Diabetic affections of the lower extremities may be classified into those due primarily to impaired circulation, and those due to infection. But the two overlap in many instances. These lesions are supplanting coma in an increasingly larger percentage of diabetic deaths and are becoming more and more problems of great importance. The responsibility of both physician and surgeon is very great. They have to consider the saving of life or limb, but many times the economic side must decide the course of action. An artificial limb is more economical and satisfactory than a painful leg or prolonged hospitalization.

Conditions due Primarily to Impaired Circulation

Estimating the efficiency of the circulation of lower extremities.

1. General appearance of the limb. Evidences of malnutrition such as atrophy, exceptional prominence of the bony land marks and extensor tendons, edema, or thickening of the skin indicate impaired circulation. Variations from normal color, as blanching, mottling, cyanosis or increased redness signify lessened efficiency of the blood supply.

2. The angle of circulatory sufficiency. Depression or elevation of the normal foot causes very little change in color. When circulation is impaired depression of the foot induces a red flush involving the toes and the dorsum of the foot. Elevation of the same foot to 180° causes blanching. The rapidity with which the color changes take place indicates the degree of impaired circulation. When the limb is elevated to 180° it blanches and as it is lowered gradually the angle at which the reddish hue returns is known as the angle of circulatory sufficiency. If it must be lowered to level, it is 90° and if it must be below this, the angle is less than 90°.

3. Palpation of Arteries. Pulsations of the femoral, popliteal, posterior tibial and dorsalis pedis arteries can be felt in nearly all normal individuals. The dorsalis pedis artery is palpable just lateral to the extensor longus hallucis tendon and the popliteal is felt best just lateral to the semimembranosus and semitendinosus tendons in the upper part of the popliteal space with the patient in the prone position. Absence of arterial pulsation means occlusion at the point palpated. The condition of the dorsalis pedis is the best index of the circulation in the foot.

4. Reactionary hyperemia normally takes place in the extremity after it has been blanched by an esmarch bandage. Failure of reactionary hyperemia means impaired circulation of the parts. Moskowics uses this fact for determining the point at which an amputation should be done. He operates at the point just above where flush ends. Matas uses it in a modified way, in thromboangiitis obliterans and aneurysms. He causes ischemia, then compresses the main artery and notes the rate of return of rubor which gives a rough estimate of the efficiency of the collaterals. Buerger belittles the practical value of both tests.

5. Local temperature of the extremities compared with an area of good circulation, shows a marked lowering when the arteries are insufficient. Palpation with the hand is accurate enough for determining this. It is well to start at the mid-thigh and pass down toward the toes. A point of definite temperature change means occlusion of the artery supplying that area.

*Thesis submitted to the Faculty of Surgery of the Graduate School of Medicine of the University of Pennsylvania in partial fulfillment of the requirements for the degree of Master of Medical Science (M.Sc.[Med.]) for graduate work in Surgery.

6. The oscillometer is an excellent instrument for determining the site of obstruction in a leg. Buerger and Petty recommend it. The instrument measures the blood pressure and the amplitude of the pulsations of the vessels. The average normal readings with the Pachon type of oscillometer are as follows:

F1—Femoral 10-18
F2—Just above knee 10-12
Po—Just below knee 8-10
A—Ankle 1.5-4
Pe—Foot 0.25-1

In occlusion of the arteries from the femoral down, these readings are reduced to much smaller values and at the foot and ankle may be little or nothing. Oscillimetry gives no information regarding the extent of collateral circulation but does indicate the amplitude of the arterial pulsations. The latter are influenced also in direct proportion to the force of the heart beat. Simpson, working at the Mayo clinic, concludes that oscillimetry is of value in determining the presence and amplitude or absence of pulsation. The oscillometer is an instrument of precision to be used with other clinical findings, thus eliminating records which are based on impressions only.

7. Roentgenograms of blood vessels are valueless in determining the blood supply to the feet in diabetes. Arteries demonstrable by means of the x-ray have the Mönkeburg type of sclerosis.

8. The histamine test has been suggested for estimation of the circulation and of the ability to resist infection in the lower extremities. Lewis presents the conception that the skin reaction to histamine is purpositive, producing local reaction to defend the cells from injury.

The patient is placed flat with legs extended and the skin is cleansed with alcohol. One drop of a 1:1000 solution of histamine acid phosphate in .5% chloretone as a preservative is placed on the skin on the midthigh, midleg, ankle and dorsum of the foot. Each area is pricked seven times with a needle. The wheal and flare are complete in five minutes in the normal reaction, but are delayed in an extremity with impaired blood supply.

Starr, working at the University of Pennsylvania Hospital, found a close parallel between his results with histamine, with Stewart's calorimeter method, and with the clinical findings. The reports by Starr are suggestive but further clinical evidence is necessary for final evaluation of the method.

9. Symptoms. Pain is very helpful at times in evaluating the circulation to the extremities. A history of intermittent claudication some years previously so severe that the patient was forced to sit down and later a cessation of the symptoms suggests a limitation of blood supply to the part at first with development of collateral circulation later. Other types of pain are steady throbbing, burning, or shooting which may be out of proportion to what would be expected from the lesion and when severe and of long duration the prognosis for the limb is poor. Sometimes either elevation or lowering of the affected part causes pain and indicates probable impairment of circulation. Hyperesthesia and hypoesthesia may also be present.

Gangrene

Gangrene is the most serious surgical complication of diabetes. Buerger defines gangrene as "the death of macroscopically visible portions of the body, invisible liquefaction of tissue being known as molecular death or ulceration."

In Warren's 300 autopsies, 55 or 18.3% had gangrene. There are three main types of gangrene: (1) arteriosclerotic or senile gangrene, (2) embolic, and (3) diabetic.

"Arteriosclerotic gangrene is due to gradual occlusion of the larger vessels, usually with superimposed attacks of thrombosis, the process of occlusion being more rapid than the establishment of collateral circulation, with resultant atrophy, and if continued without trauma or infection gradual mummification of the parts." (McKittrick and Root.) This type gives true dry or non-diabetic gangrene.

Embolic gangrene is the type that develops during the course of another disease and is not characteristic of diabetes. Due to lack of collateral circulation loss of the limb or part usually results.

Diabetic gangrene is not simulated in the non-diabetic except to some extent by thrombo-angiitis obliterans. In the diabetic type narrowing of the lumen may progress for months or years, with the development of collateral circulation. During the progress of this process there may or may not be symptoms, but eventually there comes a point of equilibrium where the combined blood supply from both main and collateral vessels is just sufficient for the ordinary needs of the limb. As soon as any extra stress is placed on the part by trauma or local infection creating a greater demand for blood, it cannot be supplied and death of the tissue takes place or infection spreads. The continued supply of a small amount of blood does not allow the tissues to dry up as in either the arteriosclerotic or embolic type and moist gangrene with infection results.

Due to the decreased blood supply the infec-

tion fails to localize and gradually spreads by way of the lymphatics and blood stream, causing general sepsis. Failure to mummify and the presence of infection are the characteristics in diabetes, hence the term diabetic gangrene.

Etiology of Diabetic Gangrene

Arteriosclerosis is the background of all gangrene. Warren states that he has never seen an autopsy or read the autopsy protocol on a diabetic of any age whose disease lasted more than five years that did not have arteriosclerosis. The most important and most serious secondary pathology in diabetes is in the arteries.

There are two main types of arteries: The elastic as the aorta, carotids, and iliacs; and the muscular as the peripheral and splanchnics, including the arterioles.

The characteristic lesion of an elastic artery in the non-diabetic is the atheromatous plaque which begins as subendothelial streaks or spots. The plaque is translucent and slightly raised. The elasticity of the vessels is not impaired. Microscopic examination shows swelling and loosening of the intercellular substance of the intima with deposition of fat droplets, which consist mainly of cholesterol esters. As the process progresses the endothelium becomes involved. These changes are apparently reversible. Further progress consists of more marked swelling with hyaline change of the ground substance of the intima, infiltration of lipoids and new formation of fibrous tissue, which also becomes hyalinized. Finally, necrosis of the tissue cells occurs with decomposition of the cholesterol esters to characteristic needle-shaped cholesterol crystals and fatty acids which sooner or later combine with calcium and later becomes calcareous or even bony. This pultaceous material may be swept away when an ulcer is formed. This type of degeneration takes place in the large or elastic vessels in the non-diabetic and is known as true arteriosclerosis or atherosclerosis. Similar degeneration except calcification in the smaller or muscular vessels is indicative of diabetes. In other words, the atheromatous lesion in the intima of the muscular arteries is the characteristic type of arteriosclerosis in the diabetic.

The characteristic lesion in the small or muscular vessels of the non-diabetic is known as the Mönkeburg type and consists of the deposition of calcium in the connective tissue fibers of the medial coat. This sooner or later replaces the muscle fibers and goes on to cause a calcified mass and even bony formation which may later involve the intima and result in thrombosis. There is no relation between these two types of sclerosis. Although the two forms may coexist in the diabetic patient, the medial type has no relation to the diabetic condition.

The etiology of arteriosclerosis of the diabetic type is dependent on the high sugar content of the blood. The sudden fluctuation in its concentration in the blood with changes in osmotic pressure between intima and blood may be a factor in the production of the intimal injury. Acidosis injures the intima of the vessels. It is also believed that there is some relationship between arteriosclerosis and high fat intake.

Diabetes, aside from inducing arteriosclerosis, acts directly as a cause of gangrene by interfering with nutrition and metabolism of the tissues. Minor injuries as paring of a corn, or a blister from an ill fitting shoe are more frequent causes than crushing or major injuries. Strong chemicals or antiseptics as tincture of iodine act as a contributing cause by injuring the tissue. In other words, anything which lowers the resistance of the tissue allows infection to enter and may result in gangrene. It has been reported that more cases occur during winter months. The incidence of gangrene is greatest in old age. McKittrick's and Root's average was 64.11 years. Eliason's and Wright's figures are about the same. Obesity is a common accompaniment of diabetes and statistics indicate that it is a predisposing cause.

Complications of Gangrene

1. Cardiovascular. Cardiovascular changes are accompaniments of gangrene. Certain accidents as cerebral hemorrhage and angina pectoris or other cardiac conditions are complications of gangrene.

2. Infection. Septicemia is a common complication of diabetic gangrene. Organisms enter the blood stream and can be recovered by blood culture. Every case of gangrene with a temperature of 100°, or with any other marked symptoms of sepsis should be regarded as one of septicemia. Gas bacillus infection is occasionally seen. Tetanus has been reported.

Treatment of Diabetic Gangrene

1. Prophylaxis consists in controlling those factors known to act as predisposing causes.

(a) Control of blood sugar should be maintained at all times. The patient who neglects treatment invites gangrene and other complications. Obesity should be reduced.

(b) Care of the feet is of utmost importance in the prevention of gangrene in those patients with evidences of poor circulation. In the New England Deaconess Hospital and the Philadelphia General Hospital a chiropodist and assistants are

assigned to these duties alone. Epidermophytosis is treated with two per cent aqueous solution of mercurochrome in the mild cases and with sulphur and salicylic acid in the more severe cases. Pedal hygiene is taught the patient by the slogan, "Keep your feet as clean as your face." The feet are washed daily with soap and water and dried thoroughly. The nails are kept clean and trimmed properly without injuring the soft tissues. Shoes should be worn that fit well, being neither too tight nor too large and of proper shape. New shoes should be broken in gradually. A medium weight cotton and wool sock changed daily should be used. Corns are treated with salicylic acid one dram and collodian to one ounce. They are not to be cut. A pad may be worn to distribute pressure and protect the corn. Calluses under the ball of the foot are prevented by curling and stretching of the toes 20 times daily and by finishing the step on the toes instead of the ball of the foot.

(c) Abrasions of the skin call for a physician's care. Irritating antiseptics as iodine should be avoided. Adhesive plaster predisposes to infection. The usual aseptic care is indicated after using alcohol as an antiseptic. The foot should be kept at rest and bare until healed.

(d) A soft corn is potentially an osteomyelitis of a phalanx. The blood supply and tissue underlying it are both deficient. Roentgenograms determine the involvement of bone and immediate amputation of the toe is advisable according to McKittrick and Root.

(e) Recurring ulcerations are dangerous. They are an open avenue for infection and if due to a deformity of a toe, the treatment must be by amputation or otherwise, rest in bed will aid in healing the ulcer. Stiff toes can sometimes be mobilized by suitable exercises.

(f) The care of the bed patient is important. The foot needs special attention to prevent pressure sores on the heels and malleoli. Pressure sores over the sacrum can be prevented by use of a Balkan frame. Hand grips attached above allow the patients to lift themselves and relieve the pressure from the back and sacral region. Heavy woolen stockings on the feet are helpful. Petty supports the well leg with a posterior molded plaster of paris splint suspended from above and just high enough for the heel to clear the bed. The parts should be bathed frequently with soap and water. Bed patients should exercise, thereby aiding their circulation and general well being. During the administration of insulin exercise helps to utilize glucose. Joslin cites an instance of a young diabetic who on his usual dose of insulin after a very strenuous day of exercise, developed hypoglycemia and coma. He believes that all surgical diabetic patients should exercise as a matter of routine.

(g) In addition to the general exercise, the postural treatment of Buerger is important for increasing the circulation to the lower extremities. It is contraindicated in cases where gangrene has become extensive, or where a phlegmon has developed, when the condition is too painful or where extensive thrombosis has taken place. The method consists of first elevating the leg to 60° or 90° from 30 seconds to three minutes or just long enough to produce blanching. Second, the leg is hung down one minute longer than necessary to produce rubor. Third, the leg is placed level for from three to five minutes. These three positions require from six to ten minutes and constitute a cycle. Six or seven cycles are repeated during one hour and constitute a seance. A seance is performed every alternate hour and six or seven seances daily. Heat should be applied during the hour of resting preferably by means of the electric light cradle.

The resting limb should be kept at the depressed angle which is just sufficient to give normal color. It is harmful to have the leg in a position that produces ischemia.

Allen has advocated the following modification of the postural exercises: The second position is carried out by the patient sitting on the edge of the bed while he systematically dorsiflexes and extends the feet. Next, he inverts and everts the feet and then flexes and extends the toes. There should be a definite pause with relaxation between these positions. The Buerger inclined board adjustable from about 30° to 75° is an aid to the patient carrying out the exercises.

(h) Hot air treatment is useful in stimulating circulation. Great care must be used in applying it lest a burn result with dire consequences. It is contraindicated in extensive gangrene, phlegmon and attacks of acute or recent thrombosis. Buerger does not believe that the application of hot air for short periods is of any benefit but the treatment should be carried out for four or five hours or as long as the postural exercises.

(i) Diathermy may be tried when infection is not present. McKittrick and Root emphasize its danger of burning and do not use it. Buerger uses it for early cases with threatened gangrene and intermittent claudication.

2. Non-operative Treatment. The indications for the non-operative treatment of conditions due to circulatory deficiency are: (1) a superficial ulceration or a gangrenous patch on the foot or

lower leg with palpable pulsation in the dorsalis pedis artery; (2) a superficial lesion as above without palpable pulsation in the dorsalis pedis artery providing infection is slight, pain is not severe, and the foot is warm and its color compares favorably with the other foot on elevation and depression, thus indicating the existence of a collateral circulation; (3) a demarkated and apparently superficial area of gangrene near the tip of a toe with the above conditions fulfilled, when time is no factor and when amputation of the toe might precipitate higher amputation; (4) failure to obtain first intention healing following any operation on a lower extremity, providing spreading infection is absent.

The objectives of non-operative treatment are: (1) removal of existing infection; (2) removal of gangrenous slough; (3) the stimulation of circulation to encourage granulation and growth of new epithelium.

Treatment of Infection. Rest in bed is important. Passive congestion must not be permitted to exist. Dakin's solution is a valuable remedy. If this is not available the preparation called hyclorite may be substituted and is efficacious. McKittrick and Root recommend for protection of the skin a solution of ordinary rubber cement diluted 1 to 8 with ether. This is used instead of, or in conjunction with, the older method of vaseline gauze strips. The Dakin's solution is injected through the tubes every two hours. Dichloramine T, five per cent is a good antiseptic. Hexylresorcinal solution has recently come into vogue with some and may be used. Ultraviolet light has value when applied to sluggish wounds with slight infection. Great care must be used to avoid burns with it.

Removal of slough is best accomplished by the use of Dakin's solution. Excision should not be done. Stimulation of circulation consists of the same measures as for prevention of gangrene, namely: Postural and active exercises, superheated air and diathermia.

The greatest stimulus to healing is eradication of infection. Tincture of myrrh may be used. Strips of adhesive flamed and strapped over the wound aid in epithelization.

3. Operative Treatment.

(1) Indications for operative treatment are: (a) gangrene of one or more digits; (b) severe pain with or without a small area of local gangrene which has not yielded to conservative treatment; (c) deep or extensive infection which endangers life because of the patient's poor general condition; (d) a severe diabetic crisis demanding relief from the burden of sepsis; (e) economic exhaustion.

(2) Types of Operation: (a) incision and drainage alone in gangrene are rarely indicated. But combined with amputation of the gangrenous part they may do some good. Incision for infection should always be wide, leaving no overlying edges, and made with due regard to the blood supply of the part. The chances of success are best with a foot that is warm and without pain; (b) periarterial sympathectomy, arteriovenous anastomosis, and ligation of femoral vein or artery have no place as operative procedures in the treatment of gangrene; (c) whether or not a limb or digit should be amputated, requires at times very keen surgical judgment based on an accurate understanding of the methods of determining the circulatory state of the limb. There must be a thorough study of the individual case by the different methods. No "rule of thumb" should be used in determining this very important point. The general condition of the patient and amount of infection must be taken into account. The old individual with a gangrenous toe is best treated conservatively, awaiting spontaneous amputation of the toe; while if amputation is attempted, gangrene of the leg will be precipitated, necessitating a thigh amputation with probable death of the patient. This condition prevails when the circulation of the whole leg is very much impaired.

Amputation of a toe is rational: (1) in gangrene of a toe with good pulsation of the dorsalis pedis artery; (2) fairly well demarkated gangrene of a toe in the absence of a pulsating dorsalis pedis artery, provided the foot is warm and of good color, especially when dependent. In either case, the patient must not be suffering severe pain except such as can be explained by the infection present.

Amputation of a limb should be done under the following conditions: (1) definite gangrene of one or more toes in the absence of a dorsalis pedis pulse, provided the foot or part of the foot is cold and of poor color or provided there is a definite point of temperature change in the lower leg even though the foot feels fairly warm; (2) beginning gangrene with spreading infection involving the deeper structures of the foot; (3) deficient blood supply, without actual gangrene in which pain is not relieved by conservative measures; (4) a viable foot as far as circulation is concerned, but in which the prolonged sepsis endangers life because of diabetes or complicating conditions.

By the exercise of good judgment and with

a definite knowledge based on a careful study of the case, many major amputations can be avoided. This was borne out in McKittrick and Root's clinic by the fact that in 61 amputations there were only six re-amputations and three of these were in patients who had refused the major operation as a primary procedure.

(d) Amputation. Leg or thigh amputations. Eliason and Wright state that the question of a stump for an artificial limb should never be considered in the aged as they seldom can be induced to wear an artificial limb. It is permissible to do a leg amputation if (a) the skin is warm and of good color to the level of the ankle; (b) if there is good pulsation in the popliteal artery; and if (c) there is no evidence of lymphangitis or phlebitis above the lower third of the leg. This type of operation is the one of choice if the patient is a woman under sixty or a man under fifty-five years of age, or if high amputation of the other leg seems probable. Patients over fifty-five years of age in the male, and sixty years of age in the female, seldom learn to use an artificial lower limb because it is difficult for them to keep their knees straight and they finally wear a peg fastened to the flexed knee. The site of election for a leg amputation is at the junction of the upper and middle thirds. Amputation through the lower leg is never satisfactory.

The indications for a thigh amputation are: (a) A condition permitting primary suture and affording the shortest and surest operation; (b) findings that will prevent subsequent use of an artificial limb, such as failing eyesight, or mental instability; (c) inability to feel any popliteal pulsation, unless the skin is warm and of good color, at least to the level of the ankle; (d) failure to palpate the femoral artery in the groin; (e) extensive infection which makes leg amputation unwise.

The Gritti-Stokes type of amputation is preferred by some, but in view of the technical difficulties of the operation and the fact that end weight bearing is seldom used, it is an unnecessary and always an inadvisable refinement.

(e) Surgical technique will not be discussed in full, but a few points will be mentioned in doing an amputation. All dead space should be eliminated to avoid collections of serum and blood. All bleeding points should be tied. No drainage of the stump should be used. Local resistance is poor and a foreign body predisposes to infection. A tourniquet is contraindicated because of the danger of producing further thrombosis of the vessels and because temporary anemia during the operation lessens the nutrition of the tissues and interferes with primary healing.

Conditions Due Primarily to Infections

This group of conditions is similar to that in the non-diabetic but altered by diabetes. The blood supply is usually normal or only slightly impaired.

This group includes (a) simple infections, including septic abrasions, paronychiae, varicose and other superficial ulcers and burns; (b) osteomyelitis, usually of a phalanx and (c) infected corns and calluses, including the so-called "perforating ulcers."

Symptoms—These are characteristic of infections in diabetics. Locally, the lesion is more sluggish in appearance, yet progression is much more rapid. There is more destruction of tissue, more involvement of bone and less tenderness. The diabetic has less pain, fever and elevation of pulse than a non-diabetic with the same lesion. Since the hyperglycemia is more difficult to control, the lesion is more resistant to treatment and a vicious cycle is in progress.

Diagnosis—No gangrene is present in a foot with good circulation unless it is an extensive infection. Osteomyelitis of a phalanx under an infected corn is easily diagnosed by roentgenograms. Infected corns are usually innocent in appearance but should always be viewed with suspicion if they are present more than two weeks. Gentle exploration with a probe will give the diagnosis before roentgenograms will show it.

"Perforating ulcers" in the diabetic, occur characteristically as ulcerations in a pre-existing callus usually underlying the heads of the second, third and fourth metatarsals. A fallen transverse arch is the cause and needs correction for cure of the ulcer. There is usually hypoesthesia. Scant blood supply around these is usually a causative factor.

Treatment—Non-operative. Superficial infections, paronychia, infected calluses or simple varicose ulcers usually respond to treatment very slowly. The indications for treatment are: Removal of existing infection, removal of gangrenous slough and stimulation of granulation and epithelization.

In infections about the base of a nail, the loose nail should be removed and infection treated. In "perforating ulcer" the patient must be kept off his feet, the overlying skin edges are removed and Dakin's solution or other antiseptic is used to control the infection. Then the callus is carefully pared without drawing blood. Later, suitable attention must be given to improving the transverse arch.

Osteomyelitis of a phalanx is usually chronic, but aggravation takes place from time to time causing the toe to become red, swollen and painful. During this period mild antiseptic solutions are applied continuously. When the acuteness of the infection has subsided, the toe should be amputated.

Operative Treatment of Infections

1. Blood cultures. A pre-operative blood culture taken in these cases aids in treatment and prognosis, and is a protection to the surgeon and his reputation.

2. Incision must be ample, extending as far or farther than the process. The blood supply must be conserved and, if possible, scars on the sole of the foot should be avoided. No more of the foot than is necessary should be sacrificed for ample drainage. A crippled foot is better than no foot. Insufficient drainage at the beginning may necessitate amputation later.

3. Minor amputations are necessary for osteomyelitis of a phalanx, for an ulcerating corn, or unhealed callus resisting prolonged treatment, or for adequate drainage of deep and extensive infection.

4. Major amputations are necessary for sepsis of a foot so extensive as to endanger life by general septicemia.

Treatment of Septicemia

Local Treatment—In septicemia as revealed either by a positive blood culture or by clinical findings, a guillotine amputation is done above gross infection through the lowest level at which circulation is good. Skin, muscle and bone are all cut at the same level. Carrel's tubes are placed at the end of the stump which is irrigated with Dakin's solution every two hours.

General Treatment. The treatment of staphylococcus septicemia is not very encouraging. Kolmer advises the following: watch for localized collections and drain immediately. Blood transfusions in small amounts frequently. Immunization of the donor with staphylococcic vaccine may have some value. He believes mercurochrome may help and 20 c.c. of 1% solution should be given to the average adult. Metaphen 20 cc. of a 1:1000 solution may be tried and also 20 c.c. of Pregl's iodine given daily intravenously. The value of antiseptics intravenously is a matter of much discussion and many clinicians doubt their helping in this type of infection.

In streptococcus septicemia, Kolmer recommends 100 c.c. of antistreptococcus serum intravenously on the first day and repeat or give 50 c.c. intramuscularly on the second day. Jopson and Eiman believe that polyvalent antistreptococcus serum has decided value and the best results are obtained when the serum is administered early in large doses before secondary foci have time to develop. In nineteen cases treated by them under favorable conditions, fifteen or 79 per cent recovered. They gave from 100 c.c. to 850 c.c. intravenously in 100 c.c. doses. If 200 c.c. however, do not produce any favorable effect, it is useless to continue. Kolmer advises transfusion because the antibodies of the donor help to combat the infection in the patient. He states that neoarsphenamine 0.6 gms. and Pregl's iodine may be given with some possibility of benefit.

Carbuncles in Diabetes

Because of the dire consequences that arise from carbuncles in diabetic patients, the subject deserves special consideration.

Incidence

At the New England Deaconess Hospital, there were 22 cases in 3,470 diabetic admissions and five or 26.3 per cent of these died. It is explained, however, that this does not represent the true incidence or mortality because only the more serious cases enter the hospital.

Diagnosis

This is the same as in the non-diabetic. There is an area of hard brawny swelling with purplish necrotic center with great, and at times, very extensive edema about it. Chills, fever, rapid pulse, and malaise accompany the severe carbuncle. The usual location is on the back of the neck and back.

Course

A carbuncle starts as a localized infection but frequently results in generalized blood stream infection. It is very painful. Due to the lowered resistance in diabetes, the lesion does not localize well and a large area of infection results with tremendous absorption, great constitutional disturbances, and a marked alteration of the diabetic balance with early severe hyperglycemia and acidosis.

Treatment

All cases of carbuncles in diabetes should be hospitalized. The diabetes must be handled as mentioned under the paragraph dealing with surgical emergencies.

The operative treatment must be immediate without awaiting fluctuation or central necrosis. Stellate incisions should be made to and beyond the induration. Carbuncles cannot be opened too extensively. The flaps should be dissected back and the open wound packed with dichloramine T in gauze. Sloughing of tissues is always more

extensive than anticipated before opening and error comes from too restricted an operation than from too extensive.

The post-operative care consists of daily dressing of the wound with dichloramine T. in gauze, keeping the flaps well back until all slough has separated. Then an attempt is made to approximate the flaps by adhesive straps to hasten closure and reduce the size of the scar.

Insulin should be prescribed from one injection to the next with frequent blood sugar estimations. As improvement takes place, the patient runs great risk of going into hypoglycemic shock due to the rapid development of glucose tolerance.

Summary

In this thesis the following points are discussed:

1. General surgery of the diabetic, including incidence, operative risk, diagnosis of surgical conditions in the diabetic, pre-operative and post-operative care.
2. The choice of an anesthetic.
3. Affections of the lower extremities classified as those due primarily to impaired circulation and those due primarily to infection.
4. Methods of estimating the state of circulation of the lower extremities.
5. Gangrene including types, complications and treatment.
6. The symptoms, diagnosis and treatment of infections.
7. Carbuncles in diabetes.

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Should the Development of Facilities to Remedy Physical Defects at Special Student Rates Be Carried On?

(*Continued from Page 356*)

money is difficult to obtain and people are out of work, experience the effects of these conditions more than any other profession and suffer accordingly. They realize that during the period of prosperity, with specialism and large fees, they have been lethargic in their interest in progressive preventive medicine, in health education, industrial medicine, free clinics and hospitals. Now the handwriting appears on the wall, their eyes are opened, they are aroused, and can only see with despair the dawn of socialized medicine, to which the profession is radically opposed and which it is not prepared to accept. In the ultimate we are all members of an organized profession which has definite fraternal and professional relations and to which we turn for the promotion and progress of medical science. At this time I feel that the medical profession on the whole is in sympathy with our students health work when the service is confined to registered college students within the college confines. There is no objection by the profession to the care of cases of acute surgery, communicable diseases, physical examinations or preventive medicine. However, I am sure that antagonism must be carefully guarded against. At this time when the world is in the midst of such economic stress my feeling is to defer definite decision of the question we are presented with, and to meet circumstances as they arise.

Therefore, in conclusion, I would advise that we recommend to our College Presidents the granting of funds sufficient to cover a complete service for our students during these depressed times, to provide medical and surgical care for cases that have occurred after registration, and to grant unlimited dispensary and hospital care during the period of the semester without special fees. Further we should limit our activities to our Campus confines and not visit ill students in their homes, but treat them only in the college dispensary and hospital. This principle will obviate any difficulties with the outside profession and provide the fullest measure of service to our students and to the institution which we represent.

The
JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA, *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

North Dakota State Medical Association
South Dakota State Medical Association
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M. E. Herz, *Business Manager*
W. L. Klein, 1851-1931
84 South Tenth Street, Minneapolis, Minnesota

MINNEAPOLIS, MINN., JUNE 15, 1934

THE COURT OF HONOR

In recognition of scholastic achievement in the graduating class of the University of Minnesota, the Minneapolis civic and commerce association, the university contact committee and the Minneapolis junior association of commerce sponsored the second annual Court of Honor, a civic appreciation banquet at the Nicollet hotel on the evening of June 7.

Various organizations acted as hosts for the graduates of the different colleges; certain members of the Hennepin county medical society were there to take care of those from the medical school, 13 in all, while the entire number *circa* 150 in caps and gowns lent a dignity and impressiveness to the ceremonies.

President Coffman addressed the parents in a humorous vein "assuming that the fathers and mothers were just as surprised as he that they had graduated, and assured them that the faculty had done all in its power to prevent them getting honors but without avail!"

The honorable John P. Devaney, chief justice of the supreme court of Minnesota presided, and made an impressive appeal for intelligent leadership in politics, saying among other things, "When you criticise our politics, you are looking in a mirror at your own image."

We have on more than one occasion made appeals through these columns to physicians for more active participation in government, not only on election day but in the formulating of policies before and after elections. This is a good time to go through those loose leaf files and scan the names of all the duly elected servants we so carefully put away for future reference after the last election. This is the *ad interim* period, a time for sagacious prophylaxis and perhaps propylactic sagacity.

A. E. H.

"DOES THE HEART FAIL IN THE ACUTE INFECTIONS?"

Dr. Louis M. Warfield's excellent article on this subject is printed in this number of the JOURNAL-LANCET.. His large experience and valuable study of this subject makes careful perusal advisable. The knowledge that the circulatory disturbances occurring in pneumonia are seldom due to diseased conditions in the heart muscle in the majority of instances has been growing and the study of the peripheral circulation has given clear evidence that in the great majority of instances the disturbances lie here rather than in the heart. Therapy which recognizes this is more effective and intelligent than the old custom of giving digitalis to every pneumonic patient. The study of the work of the New York Committee on the use of digitalis makes clear that no essential advantage is derived from this drug in pneumonia, and also that its administration carries with it certain definite dangers. The modern approach to the problem of

the treatment of pneumonia includes, first, a recognition of the causative organism and its type, second, the administration of serum when pneumococcus type 1 or type 2 serum can be given early, third, the avoidance of drugging against a possible myocardial failure and, fourth, the recognition of the part played by the peripheral circulation as brought out so well in Dr. Warfield's paper.

S. M. W.

THE CLEVELAND MEETING

This is the closing day of the A. M. A. Meeting in Cleveland and reports have trickled through to the effect that it has been one of the best attended and most successful sessions in the history of the association.

Cleveland's central location and her public auditorium, perhaps the best adapted for conventions of any public hall in the country contributed much to this.

In order to have a full attendance, such centrally located cities must henceforth be ever chosen and increasingly larger meeting quarters be sought. Unless the various sections can be housed under one roof as they were in Cleveland they might as well be scattered about the country in smaller centers of populations. This would give the coast towns their only chance at what might be called sub-conventions while the house of delegates convene at the seat of govenment in Chicago.

A. E. H.

THE DULUTH MEETING

The annual round-up of the Minnesota State Medical Association will take place this year at Duluth, July 16, 17 and 18, and every old timer knows that it will be good.

Duluth is a great little city on the great but brineless sea that helps so effectually to keep the members from straying far away from the meeting place after once assembled. Explorations in other directions are reserved for mountain climbers. The *alpen-stock* will not be found necessary but a few long, slender sticks will variously shaped heads, some round, white balls and an eagle eyed-caddy will help to make the intervals of leisure more enjoyable in the hills round about.

The scientific exhibits and demonstrations that have proven themselves such a drawing card in the past, show indications already of becoming greater than ever at this meeting. The newly installed president of the American Medical Association will be there; it is a strenuous office to hold, as every state meeting seems to require his presence.

Timely topics have been well chosen in the various fields such as cardiac irregularities, occupational dermatoses, lead poisoning and silicosis, brain surgery, hypertension and some programs prepared by special societies. A "medical question court" is something new to be tried out as a feature of the Monday afternoon program. The attending members are to sit as judges while Dr. W. A. O'Brien acts as referee. And since the association has gone forensic, we might add that Chief Justice Devaney of the Supreme Court of Minnesota and Attorney General Harry H. Peterson will speak at the informal Monday evening meeting.

A. E. H.

SOCIETIES

FIFTY-SIXTH ANNUAL MEETING
of the
MEDICAL ASSOCIATION OF MONTANA
Helena, July 11 and 12, 1934

PROGRAM

WEDNESDAY, JULY 11, 1934
8:30 A. M.
Placer Hotel

ADDRESS OF WELCOME.
L. H. Fligman, Helena.
President, Lewis and Clark Medical Society.

RESPONSE FOR THE ASSOCIATION.
W. E. Long, Anaconda.
Vice-president, Medical Association of Montana.

REPORT OF SECRETARY-TREASURER.
E. G. Balsam, Billings.

ADDRESS OF THE PRESIDENT.
B. L. Pampel, Livingston.

"Present Day Diagnosis and Treatment of Brain Tumors."
Ernest Sachs, St. Louis, Mo.

"Surgical and Non-surgical Treatment of Hemorrhoids."
W. A. Fansler, Minneapolis, Minn.

"The Essentials of a Physician."
Dean Lewis, Baltimore, Md.

WEDNESDAY AFTERNOON

"Sudden Death and a Consideration of Its Mechanism."
Julien E. Benjamin, Cincinnati, Ohio.

BUSINESS MEETING.

"Convulsions in Infancy and Childhood."
M. G. Peterman, Milwaukee, Wis.

THURSDAY MORNING—8:30 A. M.

"Spinal Cord Lesions"
Ernest Sachs.

"Cancer of the Colon."
W. A. Fansler.
"Cancer."
Dean Lewis.
"Some Observations on the Effect of Deep X-ray Treatment of Agranulocytosis, and the Clinal Effect of Amidopyrine."
Julien E. Benjamin.

THURSDAY AFTERNOON

"Epilepsy in Childhood."
M. G. Peterman.
BUSINESS SESSION.

GUESTS

Our guests are: Dean Lewis, Professor of Surgery at Johns Hopkins and President of the American Medical Association; Julien E. Benjamin, Assistant Professor of Medicine, University of Cincinnati, Ohio; W. A. Fansler, Assistant Professor of Surgery, University of Minnesota and specializing in proctology; M. G. Peterman, Professor and Director of the Department of Pediatrics, Marquette University, and of Milwaukee Children's Hospital, Wisconsin; Ernest Sachs, Professor of Neuro-Surgery, Washington University, St. Louis, Mo.

GENERAL INFORMATION

Tuesday, July 10, at 2 P. M. on the mezzanine floor of the Placer Hotel the House of Delegates will meet. Please bring credentials.

Tuesday at 4 P. M. in the same place the Council will assemble.

Tuesday at 4:30 P. M. in the same place the Presidents and Secretaries of the constituent societies will convene.

Hotel accommodations may be secured by writing the manager of the Placer Hotel. State kind of room desired and the time of your arrival.

The meetings will be in the Placer Hotel.

The Health Association of Montana will have its meetings July 9 and 10 in the Placer Hotel in Helena. Every physician is cordially invited to attend. A very fine program is prepared.

Entertainments for the ladies as well as the doctors have been planned and will be announced at the opening session. The banquet will be on Wednesday evening. Tickets are $2.00 and should be secured at the time of registration.

Every doctor of medicine in Montana is urged to be in Helena to participate in the annual sessions and help mold the medical policy in the state. If not a member, that may be arranged with the Secretary.

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B. L. PAMPEL—*President* .....Livingston
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E. G. BALSAM—*Secretary-treasurer* .....Billings

Proceedings of the Minneapolis Clinical Club

Regular meeting, April 12, 1934. President, Dr. H. Bright Dornblaser, in the chair.

THE IMPORTANCE OF FLUID CONTROL IN TREATMENT OF INTERCELLULAR EDEMA

(Complete Paper to Be Published Elsewhere)

Inaugural Dissertation

DOUGLAS P. HEAD, M.D.

1. In the past, insufficient stress has been laid on water balance in the treatment of cardiac edema.

2. Fluid control is, without question, the most important single therapeutic measure at our command in the treatment of cardiac edema.

3. Painstaking professional observation and guidance, hospitalization, vigilant nursing, and spartan co-operation by the patient are the essential factors in successfully carrying out strict dehydration therapy.

4. Of these factors, the patient's will-power to restrict himself to the fluid intake specified is by far the most outstanding. Every effort in his management must be directed toward this end. The daily examination of the tongue is, by far, the most correct barometer of the patient's co-operation.

5. It is clinically accurate to assume that in an afebrile, bed-ridden, edematous patient on a maintenance caloric intake, the difference between water excreted and fluid ingested reflects adequately loss or gain in intercellular fluid.

6. In seven years' experience, no harmful results from the immediate, gradual, or even years-prolonged restriction of fluids have ever been observed in the treatment of various types of intercellular edema.

DISCUSSION

DR. DONALD MCCARTHY: Those of us who have had the opportunity of watching Dr. Head's father have seen this same procedure used by him for a number of years and have learned, at least to some extent, by his example, of its effectiveness.

My only question about it is the fact that I think the cases must be chosen and that there are certain exceptions in which it isn't a very applicable procedure. I think Dr. Head will agree that in a patient having an infection or one having diabetes, we will have to be more careful about reduction in fluid intake. In the treatment of uncomplicated decompensated cardiac disease its efficacy is very evident to those who have used it.

DR. C. A. MCKINLEY: Dr. Head's paper is greatly appreciated. It is interesting to note that in those cases in which the edema cannot be controlled by proper

water balance and in which the mercurial diuretics such as salyrgon are indicated, their effectiveness may suddenly wane; and may be as strikingly restored through the preparatory use of acid producing salts such as ammonium chloride. This change in the acid-base equilibrium toward the acid side may also occur with the water privation advocated and account in part for the diuresis sometimes noted.

Dr. Willard White: One thing occurs to me in this discussion that concerns the dryness of the mouth. When I was an interne and shortly afterward, I happened to see several patients who developed a parotitis as a complication to some other condition. The first case was that of a patient who had been operated on for gall-bladder disease. Another one was in a patient who had sustained a crushing injury. I became quite interested in the subject because this parotitis, in some instances, develops to a suppurative state. All of those first three or four patients I saw died and I came to regard this as a very serious condition.

I looked up some information on this subject and found that the dryness of the mouth was a very important factor in the development of this condition. It occurs to me that when the fluids are restricted so extremely the resulting dryness of the mouth could predispose to suppurative parotitis which is a grave complication.

It has been worked out in the literature in a very accurate way that with the dryness of the mouth there is a plugging of the opening of the duct from the parotid by cellular debris and there is an ascending infection to the parotid. One of the most efficient preventatives of that complication is to keep the mouth moist. A good, though simple, way to keep the mouth moist is to allow the patient to suck lemon drops or lemon candy.

I can see how, in heart conditions, the extreme necessity for limiting the fluid would outweigh the risk you would run by keeping the mouth so dry, but at the same time there is the danger of having an additional serious complication by extreme dryness of the mouth over a period of time.

Very recently an internist friend of mine told me that he had a pneumonia patient in whom, because of breathing through the mouth, etc., the mouth became very dry and the patient developed a bilateral parotitis.

Dr. C. J. Ehrenberg: I had hoped that Dr. Head would mention eclampsia in reference to intracranial edema. This subject was covered in 1932 by Arnold and Fay. In their historical review it was found that a number of observers in the middle of the nineteenth century had observed brain edema at autopsy in fatal cases of eclampsia. They also reviewed the contemporary literature on cerebral edema in its relationship to water intoxication and the various types of convulsive seizures. They pointed out that eclampsia was probably not a toxemia as we have been led to believe, but was probably a metabolic disturbance, terminating in cerebral edema. They mention that Williams objected to this theory on the basis of some cases not showing a general edema and further, that some cases showed a predominance of liver disturbance. Fay attempts to explain this discrepancy by showing that many cases having convulsions due to cerebral edema do not show a generalized edema.

As a result of their review and observations they established the dehydration treatment in eclampsia and pre-eclampsia. This is done by limiting fluids strictly to what has been the fluid output on the previous day. Hypertonic solutions are used intravenously and magnesium sulphate is used by mouth to stimulate bowel action. In severe cases they practice vena section and even lumbar puncture after every four to six hours for the withdrawal of the excessive spinal fluid. They use this treatment in conjunction with sedatives, but are particularly careful in the use of morphine as it may paralyze an already depressed respiratory center.

I have not had an opportunity of using this treatment in cases of eclampsia but I have used it a number of times in cases of pre-eclampsia with gratifying results.

Dr. Walter A. Fansler: I was very much interested in Dr. Head's paper. From our experience in the use of fluids in postoperative cases, I feel that there are a great many things we do not understand about the way fluids are cared for in the body—that is, their ingestion, excretion and the exchanges which take place in the tissues. Most writers suggest rather arbitrarily that postoperative cases involving a bowel or rectal malignancy be given daily at least 2,500 or 3,000 c. c. of fluid intravenously or by hypodermoclysis.

We have found that very often such procedure does the patient actual harm. We have adopted the plan of giving the amount which we think is needed by the individual patient as indicated by the condition of their tongues and tissues, and their ability to absorb fluid by hypodermoclysis. Many take less than 2,000 c. c.

Most older patients have some cardiac and renal damage and giving these patients an excessive amount of fluid is poor judgment.

Dr. A. A. Zierold: This is a tremendously interesting subject. I feel indebted to Dr. Head for introducing the subject of water metabolism alone, aside from anything further he has contributed.

I think that the surgeon, perhaps, has been particularly remiss in his recognition of anything in regard to metabolism of water. He has been inclined, as Dr. Fansler remarked, to resort to rather arbitrary measures and to say that an individual requires 2,000, 3,000 or 4,000 c. c. of fluid quite irrespective of any knowledge of what constitutes the optimum state of hydration. Of course, we have no way of determining what is the optimum. There has been some attempt at measuring this by inserting a cannula in the areolar spaces and in the muscle, but the results have been, I think, far from satisfactory. As Dr. Head has stated, I believe that water exchange is more a matter of habit and training than anything else. There are many individuals who maintain a water exchange in the neighborhood of 400 or 500 c. c. of fluid comfortably and continuously over not only weeks and months, but years. Probably a good many individuals could exist and do exist with a low water exchange quite as well as the individual who has a water exchange of 2,000 or 3,000 c. c. daily.

We are accustomed to give postoperative cases a great deal of fluid. Whether that is to the best interest of the patient is, I think, a very reasonable question, particularly in view of the fact that we are accustomed to give tap water with low chloride content and also in view of the fact that the successful treatment of many infections is a low water intake and a ketogenic diet which tends to dehydrate the individual.

We have been following Temple Fay's ideas at the General for the last year or so on the assumption that there is an edema of the brain in certain cases, our interest being particularly identified with head injuries, and that this edema could be controlled by limitation of fluid intake. We have not obtained results which warrant continuance of this plan. You can control the total amount of fluid in the body but you cannot control the partitioning of this fluid in pathological states. If you have an injury in the brain where there is a protein exudate from the blood stream, you will get a cerebral edema which you cannot control by restriction of fluid. I do not know whether or not that is true in the edemas that are incident to eclampsia.

As the obvious end point of dehydration begins with the loss of intracellular water, a question would arise in my mind as to how far we can proceed safely in the dehydration of pathological material without establishing at least some clinical criteria of the state of hydration.

Dr. Donald McCarthy: The question Dr. White brought up started me thinking about suppurative parotitis. I have seen a rather large number of decompensated cardiac patients who have been treated with restriction of fluids and I have never seen a case of parotitis in such patients. I would like to ask Dr. Head if he has seen any such cases in decompensated patients and it might be interesting along that line. My own experience is that I haven't seen them.

Dr. Douglas P. Head: I will answer Dr. McCarthy and Dr. White first. It is a curious thing but in a large number of cardiac cases under restricted fluid management, I have never seen a case of suppurative parotitis; and the only cardiac case with parotitis which I have seen, was one without edema in which we did not restrict the fluid. That was perhaps just a coincidence. The patient had high blood pressure; her mouth was terribly dry; she had no fever; and we allowed her all the fluids she wanted. She is still alive. She had a unilateral involvement of the submaxillaries and the parotid, but with no breaking down.

In regard to digitalis being responsible for the spontaneous diuresis ensuing when intake is restricted below output—this is a question that has come up before and the only way to answer it is to try it out. I have one patient in particular who disproves that it is an effect of digitalis. When I first saw her, she had been digitalized for several weeks and, in spite of this, her edema, slight ascites, cough and other signs of decompensation were increasing. Her previous management was not altered except that the digitalis was stopped, her intake cut down to 500 c. c. and ¼ grain of codeine given every four hours for her cough, which was very severe. After ten days she was practically free from her edema and her ascites had cleared up. Her general improvement was marked. The fibrillating pulse was now 80-90. Her output had increased to between 750-1,000 c. c. daily. One grain of the powdered leaf (Upsher Smith) was then given daily for a month. There was no increase in her output which remained the same, notwithstanding that her intake had increased to an average of 650 c. c. This experiment gives evidence to our belief that the spontaneous increase in output, when fluid is restricted, has no relation to digitalis, and is an effect entirely separate and distinct from the normal diuresis expected through the use of digitalis. I might add further that 99% of our cases have never received more than ¼ to ½ grain of powdered leaf twice daily even at the onset.

I can see no particular advantage in the postoperative restriction of fluids except when the heart or general circulation is under suspicion. In such cases the usual routine of forcing great amounts of fluid may do actual harm; and an initial postoperative daily intake of 1,000-1,500 c. c. is recommended. During the first 24 hours a negative balance is expected which compensates for the loss of blood, sweat, etc. Following this period the urinary output should at least approximate within 200-300 c. c. the intake. Sweating, fever, wound drainage, hyperpnoea, emesis and loose stools often explain the frequently noted postoperative difference between intake and output. If an unexplained discrepancy between urinary output and intake persists, a careful search for signs of circulatory or renal embarrassment should be undertaken. Fine crackling rales at the end of deep inspiration heard at the extreme bases of the lungs just above the diaphragm or a faint pitting edema over the tip of the sacrum or over the lower tibiae are often the first signs noted.

In regard to the use of dehydration therapy in eclampsia, I have purposely omitted reference for the reason that I have had no experience with this type of case. It is extremely interesting to hear Dr. Ehrenberg state that it really works. It might be added that we feel that the convulsions of uremia can be controlled through the restriction of fluids. To be more positive than this requires a larger number of cases than we are at present seeing in private practice.

Some advocates of the restriction of fluid intake have shunned the carbohydrates for the reason that when metabolized more oxygen is required and thus more water formed than in the case of proteins and fats, calorie for calorie. In the cardiac and nephritic cases we are more concerned with the flatulence producing character of this foodstuff, as well as its tendency, if sweet, to cause thirst.

I agree with Dr. McCarthy regarding the selection of cases.

BILATERAL URINARY LITHIASIS

Inaugural Dissertation

E. W. Exley, M.D.

Abstract

The discussion covers the emergencies and various

difficulties encountered in the diagnosis and treatment of patients suffering from bilateral urinary lithiasis, together with the various complications which not infrequently are concomitant.

Various points in the diagnosis of the condition are brought out.

Several points in the surgical treatment are brought out as well as some factors in the prevention of recurrence and persistent postoperative urinary infection.

Lantern slides were shown to illustrate several types of cases.

Discussion

Dr. Willard White: I would like to ask if it is considered of any value to pay particular attention to the diet in patients who have had renal stones and have had them removed, with the idea of preventing further formation of stones.

Dr. Douglas P. Head: Along the same line (diet) there was some work done, I believe, on guinea pigs with high vitamin diets; but I do not know whether it was worth anything.

Dr. E. W. Exley: As far as the dietary control of urinary stones is concerned, there isn't very much definitely known about it with the exception of the fact that certain types of stones are the result of abnormal metabolic changes or dietary effects. In this respect, vitamine A may be mentioned as certain investigators have been able to produce renal and bladder calculi in rats and guinea pigs by means of the elimination of this vitamine from the diet. In certain types of stones attempts have been made to prevent their formation by dietary means—to prevent the formation of triple phosphate stone by the control of too strong an alkaline urine producing diet. There has been a lot of work done along these lines but definite conclusions have not been arrived at.

In connection with the formation of stones, the recent work in connection with the role of hyperparathyroidism in the formation of certain types of calcium calculi in the presence of parathyroid tumors should be mentioned. This theory is that in certain hyperparathyroid states we have a hypercalcemia with the coincidental withdrawal of calcium from the tissues and a resulting hyperpermiability of the kidney for calcium under favorable conditions, producing certain types of calcium calculi. We do know that certain types of stones, especially the non-shadow casting stones such as cystine and xanthine calculi, are due to dietary abnormalities, and also in those patients who have typical attacks of renal colic and who have crystals of oxalates in the urine which account for the colic.

As to the question of surgery, the general surgeons present may be able to discuss this further. As mentioned, the nephrotomies which Arnold Schwyzer has advocated are, I think, being avoided by most surgeons because of the surgical difficulties involved. The repair of an extensive nephrotomy is more or less of a surgical feat. The risk of infection and hemorrhage is great. Some of the older surgeons used to say: "Never bisect a kidney excepting at the autopsy unless you want one."

Moving pictures were shown by Dr. E. S. Platou illustrating the treatment of Epidemic Meningitis in infancy by means of ventricular and cistern puncture, and the treatment of Obstructive Laryngitis with the use of the laryngoscope.

The meeting adjourned.

Respectfully submitted,

Jas. K. Anderson, M.D.
Secretary.

Minneapolis Surgical Society

Devoted to the "Occurrence of Cancer in Private Practice in Minneapolis and the Available Means of Treatment," April 5, 1934, the President, Dr. Kenneth Bulkley, in the chair.

Dr. Kenneth Bulkley: It is a pleasure to welcome you all here tonight. Inasmuch as our program is a rather long one, I shall be very brief.

First, for the benefit of our guests, may I announce that the Minneapolis Surgical Society meets on the first Thursday of each month during the winter in the Lounge of this same floor and that each and all of you are at all times welcome. Our meetings are in no sense closed. They start promptly at 8:00 p. m. and terminate at 10:00. Our programs appear on the bulletin boards of various hospitals and can be regularly had at cost on request of the secretary.

Tonight, as you know, our subject is Cancer—the term being used in its broader sense. It is a most important subject for consideration by all branches of the medical profession, for there can be but little question but that, per hundred-thousand population, deaths from cancer are constantly increasing.

We have in this Society two standing Committees—one on fractures and one on cancer. Each of these Committees is obligated yearly to prepare for us one meeting. Tonight it is the Cancer Committee's turn. Their problem has been a difficult one and in working it out they have done conscientiously a hard and excellent piece of work. The Committee Chairman is Dr. J. Frank Corbett, to whom I now turn over the remainder of the meeting and whom I now, with the greatest of pleasure present to you—Dr. Corbett.

Dr. J. Frank Corbett: At the request of Dr. Kenneth Bulkley, I was honored with the Chairmanship of the Cancer Committee and the following men, representing all of the individual hospitals, accepted membership in the Committee:

Dr. J. F. Corbett, Chairman; Dr. F. A. Olson, Secretary; Dr. Ivar Sivertsen, Fairview Hospital; Dr. R. C.

Webb, Asbury Hospital; Dr. W. C. Peterson, Swedish Hospital; Dr. L. H. Fowler, at large; Dr. Martin Nordland, Northwestern Hospital; Dr. A. A. Zierold, General Hospital; Dr. S. H. Baxter, Hillcrest Hospital; Dr. A. E. Johnson (by invitation), Swedish Hospital; Dr. J. M. Hayes, St. Mary's Hospital; Dr. J. A. Johnson, Eitel Hospital; Dr. O. J. Campbell, Abbott Hospital; Dr. Daniel MacDonald, Deaconess Hospital; Dr. Kenneth Bulkley, Northwestern Hospital; Dr. Verne S. Cabot, St. Barnabas Hospital; Dr. Wm. T. Peyton, University Hospital.

By invitation, the following men have served: Dr. Frank J. Anderson, Dr. G. T. Nordin, Dr. C. R. Drake, Dr. A. S. Fleming, Dr. R. G. Allison, Dr. W. H. Ude, Dr. R. H. Morse, Dr. C. D. Harrington.

Three Sub-committees, including all members of the Committee but with individual Chairmen, were organized.

Dr. Ivar Sivertsen, as Chairman of the first Sub-committee, had direction of the survey of The Incidence of Cancer.

Dr. Martin Nordland, as Chairman of the second Sub-committee, made a survey of the Radium Facilities at Our Disposal.

Dr. A. A. Zierold, as Chairman of the third Sub-committee, made a survey of the X-ray facilities.

Altogether, seven meetings were held and reports and advice were received from Drs. Allison, Morse, Nordin and Ude from the standpoint of the X-ray angle, and Drs. Drake, Fleming and Peyton from the standpoint of radium therapy. Everyone on the Committee made his contribution and accepted the task imposed upon him.

As a whole, the Committee has made a study of the cancer problem in Minneapolis as to the number of deaths reported annually from cancer in Hennepin county, the number and type of cancer cases treated in the private and charity hospitals in Minneapolis and the available X-ray and radium equipment for the treatment of cancer in Minneapolis. The recent report of the American Society of the Control of Cancer indicates satisfactory X-ray and radium equipment at the Cancer Institute at the University. The Cancer Committee has, therefore, devoted its time to a study of the cancer situation and its relation particularly to the private hospitals in Minneapolis.

I am also indebted to Dr. G. E. Pfahler, who furnished me with reprints of one of his articles, "Results of Radiation Therapy in 1,022 Private Cases of Carcinoma of Breast from 1902 to 1928." This deals largely with results of X-ray therapy, and the work is old enough to permit of reduction to statistics. He considers experience with combined radium and X-ray too limited and too recent to be considered in detail. He states: "It seems to me that good results are practically doubled if a patient received thorough and skillful postoperative treatment." With his permission, I present one of his charts which substantiates this statement in regard to breast cancer.

TABLE XII

COMPARATIVE RESULTS BEFORE 1922 (LOW VOLTAGE) AND AFTER 1922 (HIGH VOLTAGE AND "SATURATION" TECHNIQUE)

	1902 to 1922 Low Voltage—Variable Technique		1922 to 1928 High Voltage and "Saturation"	
	3 Yrs. Per Cent	5 Yrs. Per Cent	3 Yrs. Per Cent	5 Yrs. Per Cent
Preoperative and postoperative—all classes	55	47	69	55
Postoperative and with no ax. glands	96	84	96	94
Postoperative with ax. glands	63	55	70	73
Postoperative—all classes	59	49	80	77
Recurrence and metastatic — all classes	39	19	34	24
Primary inoperable—all classes	42	30	42	30
Primary operable—clinically positive	87	87	93	69
Average results in all cases treated	48	33	56	40

The Committee feel that they have made a beginning, but that there remain many problems. The greatest of these is a uniform way of reporting all cases and an adequate follow-up system. This may be provided for by the further work of this or some other similar Committee. However, the first task was that of inventory and the present report is limited to that. I will now call upon Dr. Ivar Sivertsen for the survey of cancer cases occurring in private practice.

Survey of Incidence of Cancer, Minneapolis Hospitals, 1933

Dr. Sivertsen: It is generally agreed that cancer is still on the increase, notwithstanding the educational efforts being made to inform the public concerning its ravages. By looking over the records of the local health office covering the period from 1920 to 1933, inclusive, we find a definite increase as follows:

1920—445 cancer deaths.
1925—550 cancer deaths.
1930—739 cancer deaths.
1932—729 cancer deaths.

Whereas in the case of tuberculosis, one finds a definite decrease as follows:

1920—352 tuberculosis deaths.
1925—214 tuberculosis deaths.
1930—143 tuberculosis deaths.
1932—105 tuberculosis deaths.

The value of education seems to have been demonstrated in the case of tuberculosis.

In the year *1932*, 5,176 deaths were recorded in Minneapolis among a population of 489,400. Cancer accounts for 14.5% of the deaths.

In the year *1920*, 4,714 deaths were recorded in Minneapolis among a population of 380,582. Cancer accounts for 445, or 9.4%.

Dr. F. G. Gade of Oslo, Norway, gives some interesting statistics in a little book on cancerous diseases. He attempts to answer the question—Is Cancer on the Increase? He shows that, according to the figures of John K. Gore, comparing the periods 1901 to 1905 with 1921 to 1925, there is a definite increase in cancer death rate in all countries except one (France showed a decrease of 27.7%). Time does not permit the mention of all—it will suffice to note that:

Austria showed 68% increase.

England and Wales showed 47.1% increase.

United States showed 30.9% increase.

These figures are comparable with those disclosed by our local health office: 1920, 445 deaths as against 1932, 729 deaths from cancer. There is a definite increase in cancer death rate. I, for one, do not believe that this increase is altogether due to improved diagnoses or increased longevity. There are other factors which we, as yet, do not understand.

In an effort to determine the number of cancer cases treated by the hospitals in the city during 1933, reports from the hospitals were tabulated and examined. Although this may not be an exact picture, it should indicate the trend of affairs. We find that 999 cases were reported as treated in the various hospitals of the city. This figure includes 172 from the Minneapolis General and 114 cases from Hennepin County treated at the Minnesota General Hospital. In other words, 703 cases were treated during 1933 at the private hospitals, or approximately 70% of the total.

This study has as its object not only to help the physician in his care of these cases but also to inform the public that the medical profession of our city is able and willing, and also interested, in the care of cancer cases.

This report would become much too lengthy if I should go into any great detail. A few figures might be of interest. Of the total 729 deaths in 1932, we find the incidence as to sex 51% among males, 49% females. These figures conform with most records consulted by the writer. As to age, the youngest deaths were:

One year or over, two deaths.

Two to five years, four deaths.

Five to nine years, three deaths.

Ten to 14 years, one death.

The oldest deaths recorded 90 to 94 years. The greatest number of deaths were recorded in the 60 to 75 year period (337 deaths). The records do not disclose whether the young cases were sarcoma or carcinoma.

As to organs involved:

Breast led with *184 deaths.*

Stomach next, *110 deaths.*

Intestine, colon, sigmoid, rectum and anus, *134 deaths.*

Prostate and bladder totaled *112 deaths* (much to our surprise), whereas:

Cervix had *97 deaths.*

Body of uterus, *35 deaths.*

Possibly the greatest surprise came when we noted that cancer of the pancreas caused *25 deaths.*

It might also be stated that all portions of the body were represented and it is of interest to note there were 25 deaths from cancer of the larynx, pleura and bronchi. This would seem to show an increase in the type of cancer.

It is likewise interesting to note that in considering the age incidence in relation to sex, we find the greatest number of deaths among females occurs in the 60 to 64 year age group, while in males it appears in the 70 to 74 year age group, or ten years later. This bears out the statement by Dr. Dahlstrom and the writer that muscular activity has a bearing on the incidence of cancer.

How soon after discovery of tumor or suspicious symptoms did they seek medical advice? In looking over the hospital reports for 1933, one finds the first consultation ranged from one month to 20 years after the first symptoms, many stating several years. One bladder case, male, aged 63, stated he had symptoms for 40 years. We found several bladder and prostate cases had been troubled for several years prior to seeking medical advice. In stomach cases, the elapsed time ranged from a few weeks to two years. In breast cases it was noted that consultation was often immediately after discovery of the lump and ranged from one day to several weeks. Again, a few waited months. Some hospitals recorded most cases consulted the doctor sooner than others. It would seem that the prostatic patient is prone to wait longer than the others prior to consulting his physician. It seems that publicity would be of value in shortening the elapsed time in this type of disease. One hospital reported:

Stomach—five weeks to three years—most two to five months.

Sigmoid—five days to four months—most five days to five weeks.

Uterus—two weeks to two years—most six months.

Breast—three days to one year—most two to six months.

Cervix—three weeks to three years—most three to nine months.

In general, it may be stated that the average patient does not seek advice until the symptoms are so pronounced that "he who runs may read."

In the January issue of the Hennepin County Medical Society Bulletin, a notice designated, "Truths for the Public" by Dr. W. A. O'Brien, relative to the value of forming public opinion, it was stated that 6% of cancer cases in Minnesota were treated at the Minnesota General Hospital, and 8% at the Mayo Clinic, leaving 86% to be treated by private physicians and smaller groups. If this is true, there is plenty of work for all of us to do.

Conclusions: (1) From a superficial survey of the Minneapolis hospitals' experience for 1933, approximately 1,000 cases of cancer are treated annually, private physicians handling about 70% of these cases. (2) The Committee on the Study of Cancer from the Minneapolis Surgical Society feels that a certain amount of information should be given the public at large relative to cancer and cancer treatment: that the various recognized hospitals of the city are well prepared and willing to assist in the treatment of cancer by means of surgery, X-ray and radium. (3) A study of the statistics from the Minneapolis Health Department discloses a definite increase in the number of deaths from cancer over various yearly periods.

The Minneapolis Surgical Society is definitely interested in supporting and encouraging any movement which would inform, advise and encourage cancer cases to seek medical and surgical advice at the earliest

possible moment; in this way to obtain the greatest hope for a cure, and thereby decrease the incidence, morbidity and mortality from cancer.

Finally—the Committee extends its appreciation to the various hospitals and staffs for their co-operation and courtesy in forwarding the reports for this study, and to Dr. F. E. Harrington and his staff at the Health Department for their co-operation and assistance.

SUMMARY OF MINNEAPOLIS HOSPITAL CANCER EXPERIENCE, 1933

Carcinoma—general carcinomatosis	19
Breast	184
Bronchi, lungs, larynx, pleura	25
Face	80
Gall-bladder—bile ducts	22
Liver	25
Stomach	110
Intestine	8
Colon	33
Sigmoid, rectum, anus	93
Pancreas	25
Esophagus	14
Pharynx	2
Tongue and mouth	22
Jaw	9
Glands	12
Bones	10
Spine	12
Brain	7
Ovary	26
Cervix	97
Uterus	36
Vagina and external genitals	8
Pelvis	1
Prostate	71
Testes and external genitals	13
Kidney	12
Bladder	41
Skin	24
Undetermined	4
Sarcomata	12
Thyroid	1

Dr. J. Frank Corbett: In the treatment of cancer in the private hospitals by the members of this Society, it is not intended to present for discussion the treatment of the various types of cancer as it occurs in the operating room, but it is our purpose to survey the various types of accessory equipment indicated and required for the proper treatment of cancer in this community. With that purpose in view I will next call upon Dr. Arthur Zierold, Chairman of Sub-committee on X-ray Therapy.

Report on X-Ray Therapy as an Adjunct to Surgery

Dr. A. A. Zierold: Cancer, for a great many years, has been known and recognized and for a great many years surgeons have treated it. It is probable that they will continue to do so for many years to come as the problem of treatment is primarily a surgical one. It must be remembered that whenever cancer, in its primary form, can be totally excised, it can be cured and that the result obtained is more often determined by the state of the patient when first seen than by the nature of the operation. It is only when cancer is neglected and so wide-spread as to demand too great a sacrifice of substance or when it invades areas which are surgically inaccessible that the surgeon must look for other agents to attain success.

The discovery of X-ray and the isolation of radium have made available a new form of therapy. Early in its history it was found that electro-magnetic radiations of short wave length were noxious to certain tissue cells, particularly those of malignant origin. For a short time this knowledge was a two-edged sword, but painful experience developed such control of this agency that extensive and hitherto untreated areas of malignancy could be successfully attacked. At the present time radiation therapy has progressed to such a point that not only has the field and scope of surgery been greatly enlarged and the surgery itself made more effective and safe, but a new and exclusive field for radiation therapy itself has been developed.

As opposed to radium with its very short gamma rays and low energy output effective over relatively short distances, X-ray machines in common use produce radiation of considerably greater wave length, and likewise, greater energy, making them effective for greater distances. As the intensity of radiation varies inversely as a square of the distance through which it acts, and as the wave length of the radiations produced varies inversely as the voltage, it has seemed that a more desirable agent would result in combining these factors. Consequently, there have been built in recent years several X-ray machines of high voltage, ranging from 400,000 to 900,000 volts. Of these, there are six in this country, two in Germany, one in France, and two in England. While such machines more nearly approximate the ideal of radiation therapy, those producing 200,000 volts are adequate if properly used. The American Society for Control of Cancer, in its effort to standardize therapy equipment and after careful investigation of its various forms, concluded that any equipment producing 200,000 volts was ample in strength and flexibility.

We have, in Minneapolis, available for treatment of private patients, five such deep therapy units in the charge of men trained in their use. Not only is this physical equipment and personnel sufficient to provide proper and adequate radiation treatment, but they are of such number and so disposed that the treatment is well within the means of the average patient.

In recent years the idea has gained ground that cancer is an institutional disease, that it can be treated only in hospitals devoted solely to this purpose and that such institutions are peculiar and unique combinations of men and material. This is probably true in only a limited sense. The development and progress of radiation therapy is well within the memory of most of us and because it is a new branch of medical science, knowledge concerning it is not widely disseminated. To acquaint ourselves with the present status of X-ray therapy and its recent developments and to satisfy ourselves with regard to the extent and availability of this form of treatment, we have gathered together with us this evening the men responsible and directing this form of treatment in several of the various hospitals of Minneapolis and it is our privilege and pleasure to share with you the results of their experience. I take great pleasure in introducing Dr. Russell Morse.

(Continued in July 1 Issue)

NEWS ITEMS

Dr. E. J. Kepler, Rochester, was the guest speaker at the May Meeting of the Northwest Medical Society, held at Minot.

Dr. E. M. Burke, one of the well known physicians of Havre, Mont., passed away last month, after a short illness of heart disease.

Dr. H. E. Cary, a veteran Minneapolis physician, died recently at his summer home at Whitefish Lake, Minn., at the advanced age of 78 years.

Mr. Victor Anderson, superintendent of the Abbott Hospital, Minneapolis, was elected president of the Minnesota Hospital Association, at their annual meeting recently, held at Rochester.

The Mower County Medical Society held a large meeting of its members at Austin, Minn., last month, with Dr. Charles W. Mayo, Rochester, giving a lecture on "Abdominal Surgery."

Dr. F. J. Savage, St. Paul, president of the Minnesota State Medical Association, was the principal speaker at the last meeting of the Redwood-Brown Medical Society held at New Ulm on June 1.

Dr. M. N. Leland, who has been in active practice in Minneapolis for the past 30 years, died on May 20, at the age of 60 years. Dr. Leland was a graduate of the P & S Medical College, Chicago.

Word has been received of the sudden death of Dr. Carl Hedblom, formerly a surgeon at the Mayo Clinic, and later professor of surgery at the University of Illinois. Dr. Hedblom fell dead in Toronto, where he was attending a meeting.

Mrs. G. F. Nordin, was elected president of the Hennepin County Medical auxiliary: with Mrs. G. R. Matchan, president-elect; Mrs. W. W. Moir, first vice-president; Mrs. J. M. Hayes, second vice-president, and Mrs. H. W. Quest, secretary.

The members of the Sioux Falls Medical Society were addressed at their May meeting by Dr. Porter Vinson, of the Mayo Clinic, his subject being "The Value of Bronchoscopy in the Diagnosis and Treatment of Pulmonary Diseases."

Five thousand letters including folders of the Minnesota Arrowhead association, are being sent out to medical men throughout the Middle West, inviting them to attend the convention of the Minnesota Medical association, which will be held at Duluth, July 15-18.

Dr. E. D. Keyes, one of the prominent physicians and surgeons of Winona, passed away last month at the age of 75 years. Dr. Keyes was born in that city, and had been in practice for nearly 50 years, but always found time to devote to civic and charitable projects that would be of benefit to his home city.

Dr. M. H. Cramer, 64 years old, widely known physician and surgeon, who had practiced at Red Wing, Minn., for the last 31 years, died unexpectedly at his home, of heart trouble. He was active at his office until the day of his death. Although ill health during the last year had narrowed his field of activities, he nevertheless continued to take an active interest in community affairs, with which he was prominently identified for more than a quarter of a century.

The sixteenth annual session of the North Dakota Academy of Ophthalmology and Otolaryngology was held in Fargo, May 28. Henry O. Ruud, M.D., Grand Forks, presided. Chas. N. Spratt M.D., Minneapolis, present an illustrated address on "Operative Ophthalmology." Geo. M. Constans, M.D., Bismarck, discussed, "Myasthenia Gravis." At the business session Dr. Spratt was voted honorary membership in the Academy and the officers elected for the coming year are: W. R. Winn, M.D., Fargo, president; Trygve Oftedal, M.D., Fargo, vice-president; F. L. Wicks, M.D., Valley City, secretary; M. B. Ruud, M.D., Grand Forks, A. D. McCannel, M.D., Minot, and G. A. Larson, M.D., Fargo, councilors. The names of several doctors were presented for membership.

The American College of Physicians will hold its Nineteenth Annual Clinical Session in Philadelphia, April 29—May 3, 1935. Announcement of these dates is made particularly with a view not only of apprising physicians generally of the meeting, but also to prevent conflicting dates with other societies that are now arranging their 1935 meetings. Dr. Jonathan C. Meakins, of Montreal, Que., is president of the American College of Physicians, and will arrange the Program of General Sessions. Dr. Alfred Stengel, vice-president in charge of medical affairs of the University of Pennsylvania, has been appointed General Chairman of local arrangements, and will be in charge of the Program of Clinics. Mr. E. R. Loveland, executive secretary, 133-135 S. 36th Street, Philadelphia, Pa., is in charge of general and business arrangements, and may be addressed concerning any feature of the forthcoming session.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS, MAY 8, 1934

BY EXAMINATION

(April)

Name	School	Address
Bair, Hugo Linden	Harvard, M.D., 1929	Mayo Clinic, Rochester, Minn.
Baker, Thos. Williams	U. of Pa., M.D., 1931	532 5th St. S. W., Rochester, Minn.
Brink, Norvel Otto	U. of Minn., M.B., 1933	Ancker Hospital, St. Paul, Minn.
Buchstein, Harold Ferdinand	U. of Minn., M.B., 1933; M.D., 1934	135 Valley View Place, Minneapolis, Minn.
Buchtel, Henry Augustus	Harvard, M.D., 1931	506 5th St. S. W., Rochester, Minn.
Davis, Raymond Darius	U. of Minn., M.B., 1933	St. Luke's Hospital, Duluth, Minn.
Deissler, Karl Joseph	U. of Heidelberg, Dr. Med., 1931	Mayo Clinic, Rochester, Minn.
Donovan, Daniel Leo	U. of Minn., M.B., 1933	Ancker Hospital, St. Paul, Minn.
Erich, John Bernhardt	U. of Illinois, M.D., 1932	Mayo Clinic, Rochester, Minn.
Fait, Roman Vincent	U. of Minn., M.B., 1933	Minneapolis General Hospital, Minneapolis, Minn.
Fatherree, Thos. Jefferson, Jr.	Tulane, M.D., 1932	Mayo Clinic, Rochester, Minn.
Gillespie, Delmar Robert	U. of Minn., M.B., 1933	Ancker Hospital, St. Paul, Minn.
Gillespie, Donald Leo	U. of Minn., M.B., 1933	Ancker Hospital, St. Paul, Minn.
Gordon, Philip E.	U. of Minn., M.B., 1932; M.D., 1933	1511 Logan Ave. N., Minneapolis, Minn.
Hauser, George Wesley	Ohio State Univ., M.D., 1932	Health Service, University of Minnesota, Minneapolis, Minn.
Hedemark, Homer Harold	St. Louis Univ., M.D., 1933	Ancker Hospital, St. Paul, Minn.
Johnson, Douglas Leonard	U. of Minn., M.B., 1933	Ancker Hospital, St. Paul, Minn.
Kerlan, Irvin	U. of Minn., M.B., 1933	Univ. Hospital, Minneapolis, Minn.
Kostick, William Robert	U. of Minn., M.B., 1933	2357 James Ave. N., Minneapolis, Minn.
Lieberman, Nolton Senard	U. of Minn., M.B., 1932	1090 Ashland Ave., St. Paul, Minn.
Malvey, Kenneth P.	U. of Minn., M.B., 1932; M.D., 1933	Moorhead, Minn.
McKechnie, Robert Edward	McGill, M.D., 1931	Mayo Clinic, Rochester, Minn.
Mead, Newton Cromwell	Northwestern, M.B., 1932; M.D., 1933	Coleraine, Minn.
Mills, John Harold	U. of Chicago, M.D., 1933	Mayo Clinic, Rochester, Minn.
Mulrooney, Raymond Edward	U. of Minn., M.B., 1933	Ancker Hospital, St. Paul, Minn.
Nettrour, Walter Scott	U. of Pittsburgh, M.D., 1931	Mayo Clinic, Rochester, Minn.
Noble, John Lawrence	U. of Minn., M.B., 1933	Ancker Hospital, St. Paul, Minn.
O'Brien, Veronica	U. of Minn., M.B., 1933	Minneapolis General Hospital, Minneapolis, Minn.
Odel, Howard Miller	Northwestern, M.B., 1932; M.D., 1933	Mayo Clinic, Rochester, Minn.
Olson, Kenneth Lloyd	U. of Minn., M.B., 1932; M.D., 1933	1009 13th Ave. S., Minneapolis, Minn.
Pass, Isadore J.	U. of Minn., M.B., 1932; M.D., 1932	1413 James Ave. N., Minneapolis, Minn.
Robinson, Van Cooper	Northwestern, M.B., 1932; M.D., 1933	Mayo Clinic, Rochester, Minn.
Rossen, Ralph	U. of Minn., M.B., 1933	Univ. Hospital, Minneapolis, Minn.
Shima, Raymond Thomas	U. of Minn., M.B., 1932; M.D., 1933	New Richmond, Wis.
Vickoren, Angvald	U. of Minn., M.B., 1933	St. Luke's Hospital, Duluth, Minn.
Thysell, Vernon Duane	U. of Minn., M.B., 1933	Minneapolis General Hospital, Minneapolis, Minn.
Waldren, George Richard	Northwestern, M.D., 1927	Pembina, N. D.
Watson, Wm. John	U. of Minn., M.B., 1933	Ancker Hospital, St. Paul, Minn.
Wulff, Marjorie	U. of Minn., M.B., 1933; M.D., 1933	934 Reaney St., St. Paul, Minn.

BY RECIPROCITY

Foley, Maurice P.	U. of Pa., M.D., 1931	Mayo Clinic, Rochester, Minn.
Havel, Harold William	Creighton, M.D., 1933	St. Catherine's Hospital, Omaha, Neb.
Petersen, Peter Carl	Univ. of Nebraska, M.D., 1932	Ogilvie, Minn.

NATIONAL BOARD

Hays, Albert Theodore	U. of Minn., M.B., 1932; M.D., 1933	Norwood, Minn.

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The JOURNAL LANCET

Minneapolis, Minnesota
July 1, 1934

New Series
Vol. LIV, No. 13

Minnesota State Sanatorium Plan of Tuberculosis Control*

H. A. Burns, M.D.†
H. E. Hilleboe, M.D.‡
Walker, Minn.

THE administrative and epidemiological control of tuberculosis is a subject of commanding importance to all who are interested in or concerned with the abolition of this major contagious disease. Measures of control, regardless of the type of disease concerned, fall quite naturally into fairly uniform patterns. Procedures used in the control of one type of contagion can, with only minor alterations, be applied to the control of any other communicable disease. The variants in tuberculosis control which require special attention are based on its prolonged period of incubation, its chronicity, and its tendency to recur. Any program for the control of tuberculosis must be one which considers these factors.

The Minnesota State Sanatorium, with a capacity of 350 to 390 beds depending on the number of ambulatory patients and the season, serves a definite group of citizens in the state. These citizens served may live from 175 miles North West to 285 miles South East of Walker,Minnesota. Of the eighty-seven counties in the state,forty-one are served by fourteen county sanatoria. The remaining forty-six are dependent upon the State Sanatorium for the care of their tuberculosis cases. This land area comprises forty-two per cent of that of the state, and thirty-three per cent of its population.

Of the total sanatorium beds in Minnesota,82.1 per cent are in the counties supporting local institutions, while 17.9 per cent are in the State Sanatorium for patients living in the remaining forty-six counties. Bearing in mind that there were 2170 sanatorium beds in the state during 1933, there occured 1002 deaths from tuberculosis. Considering the available beds in private sanatoria and in general hospitals, where approximately 800 more beds are to be had if required, we have actually for the care of our tuberculous three beds per death. It has been estimated that for every death from tuberculosis there are three living cases with tubercle bacilli in their sputum. There are now available, therefore, facilities to house all positive sputum cases developing in the state in any one year. The Minnesota State Sanatorium plan of attack is to be a direct one through administrative and epidemiological methods, the sanatorium serving only as a cooperative yet essential part of this mechanism. The area and population served by the Minnesota State Sanatorium is sufficiently large to demonstrate the value of applying administrative procedures and epidemiological knowledge to this general problem, the direct aim of which is the elimination of tuberculosis.

The position taken by the State Sanatorium, with the approval of the Board of Control and State Board of Health, is one that tuberculosis, being a communicable disease, should be cared for as such. Tuberculosis is not inherited, either as a disease or as a tendency to a specific infection as some people believe, but it is definitely com-

*Presented before the Scott-Carver Counties Medical Society, May 13, 1934.
†Superintendent, Minnesota State Sanatorium.
‡Epidemiologist, Minnesota State Sanatorium.

municable as shown by family studies throughout the world. As the Sanatorium is the most expensive item in our control equipment, the sooner we can get our case and fatality rates down to a point making a progressive reduction of beds possible, the earlier we shall be able to justify our original sanatorium plan to the public. It is but a short time since general hospitals planned to have typhoid wards available on brief notice, and pest houses were a part of the equipment of many cities in Minnesota. They are unknown today because positive knowledge of prevention has been applied to a known condition.

The plan of control being carried out at the present time at the Minnesota State Sanatorium is a simple one that has been fully demonstrated as essential to the control of every other communicable disease; namely, the identification of all existing foci, and adequate isolation of the contagious case. For this reason the sanatorium has its place in the scheme, assuming no superior duties or traditional privileges. It remains as a center of isolation, where isolation can be taught and practiced by the patient for continued use at home. The newer armamentarium of therapeutics decreases the period of institutionalization, and makes possible the rehabilitation of a certain group of otherwise hopelessly invalided individuals. It graciously offers its facilities to all recognised health agencies and all other institutions caring for tuberculosis, and it serves to its fullest capacity as an aid to the epidemiologist and the State Board of Health.

The pioneer work of the Minnesota State Board of Health, followed by the more recent work of Myers, Harrington, and many others, as well as the educational work carried on by the Minnesota Public Health Association, have in no small way prepared the setting for the execution of the plan we are effectively carrying out in the area already defined.

There are many public-minded physicians and private citizens in our state who realize the breadth of the problem that confronts them. Some of these individuals have banded together and attempted to organize available forces for proper control. On October 27, 1933, at a meeting in Minneapolis of the State-wide Committee for Tuberculosis Control, sponsored by the State Board of Health and the State Board of Control, some excellent resolutions were passed and adopted as the state tuberculosis program. How these resolutions, often difficult of accomplishment, can be carried out to the mutual advantage of the patient in the care of his health and that of his family; to the practicing physician in increased earnings, additional medical knowledge and increased prestige in his community; to the county and state in the decreased cost of the care of patients with tuberculosis, is the prime objective of the Minnsota State Sanatorium plan of tuberculosis control.

Perhaps the most important single factor in the success of the project is the work to be carried out by the family physician. The doctor's active participation in the work is essential to its success. In fact he must become the aggressor in tuberculosis work in his community if control measures contemplated are to be successfully culminated. He must be cognizant of the tuberculosis problem as it affects the family, and as it affects public health in general. The total results of proper control of tuberculosis cannot always be completely evidenced in one generation. This makes it all the more imperative that the doctor, who spends his career in family practice and brings successive generations into the world in the same community, should assume a front line position in the warfare against the disease. Obviously one or two interested physicians cannot see all patients and their families for the identification, isolation, and care of all infected individuals. Consequently all qualified physicians in the state must participate in the general program, and be willing to subordinate their personal views to that of the group plan of control.

Four specific requirements must be satisfied before assurance can be given that the plan will continue to function smoothly. First, the family physician must be interested and willing to do his part; second, the family physician must have training or be trained in the special procedures necessary for the diagnosis, care, and treatment of the tuberculous; third, arrangements must be made for the cost of materials as well as the cost of medical services rendered by the physician to this group of patients who more often than not are unable to pay their own way; fourth, a system must be established and followed by which patients will be brought to the physician's office with the least possible interference with the doctor's routine medical practice.

In an attempt to answer the first requirement, a general survey of many of the doctors in the area concerned was made. Each was presented with a detailed outline of the plan. Almost without exception, the doctor's reaction resulted in its complete endorsement, providing that it cost him no more than some of his time, and that he had at least the possibility of getting something for his trouble. He was willing to do any amount of thankless pioneer work in order to make possible

later remunerative, as well as beneficial, public health service. He realized that he must show the public as well as the state the results that could be obtained before he could gain their personal support and financial backing. This was an opportunity for the medical profession to force something worthwhile upon the public instead of waiting for the public to force it upon the profession. We therefore are assured of the co-operation of the practicing physician.

The second requirement, that of competent medical care as judged by the medical profession itself and not the laymen, is more difficult to fulfill, but can be accomplished by a concerted program on the part of the physicians themselves. It has often been said by highly trained medical men that very few general practitioners can accurately diagnose or adequately treat tuberculosis. Therefore they feel that such work must be left to experienced physicians in the field. Perhaps this is true to a certain extent, but it does not apply to a large cross-section of the medical profession, nor does it mean that those who are unfamiliar with some of the more recently developed procedures cannot acquire proficiency by a little study and application. We are arranging a course of lectures, clinics, and demonstrations throughout the counties in our area for post-graduate study to be undertaken by general practitioners who have not done this type of work. There is no reason why physicians throughout the state cannot, by these conveniently arranged courses, learn to do Mantoux testing, take diagnostic pictures on their own X-ray machines, do pneumothorax operations, teach isolation technique, and observe and record accurately clinical pictures of their tuberculous patients.

Members of our staff are appearing before county medical societies and presenting the details of the plan with demonstrations of the follow-up work. Data taken from the tuberculosis records of that county is analyzed and the set-up is discussed as it relates to that particular county. This service is available to any local medical society. The state university teaching staff is willing to co-operate as they have already done in the past. A pneumothorax clinic is held there every Tuesday, and interested physicians are always welcome. Physicians are also welcome at the State Sanatorium for practical experience in the care of the tuberculous. In many cases where the physician is near enough to a sanatorium or the tuberculosis clinics in the larger cities, he may go and actually learn how to do pneumothorax operations on his own patients before they are discharged to home care. As soon as the patient on this treatment is discharged to the physician who sent him in, the opportunity arises for this doctor to get into the field of therapeutics. He should certainly take advantage of this chance. We feel that any qualified medical man who is interested in acquainting himself with these new techniques can easily develop skill, in most instances with a comparatively small amount of study.

Regarding the third requirement, part of the material necessary for follow-up is already being supplied to practicing physicians throughout the state. Old tuberculin, diluted and ready for use, is distributed free of charge on request by the Minnesota State Sanatorium. Because of the cost of X-ray films, much difficulty has been experienced in getting X-ray plates on all cases where this is indicated. We feel that every contact over 12 years of age with a positive Mantoux should have a flat plate taken of his chest. The number of serious lesions picked up among children under that age does not warrant the expense involved, considering the limited funds available at this time. In high school surveys when a positive reactor is found, all other members of the family will be tested, including the children under 12 years of age. This will single out most of the children in the lower age group who should be tested. The questions who will pay for the X-ray, who can take the X-ray, who will do the interpretation, and what type of X-ray should be taken always come up when tuberculosis follow-up is considered. Answering the first question, in cases where the family can afford to pay, the physician makes a regular charge. In all other cases arrangements have to be made with the local authorities for payment. In many cases the county commissioners will pay this fee if it is definitely shown that by so doing they may save future expense to the county. Obviously it is cheaper to have patients X-rayed at infrequent intervals than to wait until these same individuals break down and must be sent to sanatoria at greater and continued expense. Sometimes there are local health agencies that will contribute funds while in many counties the revenue from Christmas Seals has been made available. This detail, of course, must be arranged before the X-ray is taken, and this usually can be done by the combined efforts of the physician, county commissioners, health officers, and, in some cases, the State Epidemiologist. When neither the family nor the local authorities will meet the cost of the plates, the State Sanatorium has a small fund which can be expended for this service. X-ray equipment in public institutions is available for this activity when the work is to be done at public expense. In any event, by diligent

study of each individual situation, a solution of the difficulty is almost invariably found.

The question, who will take the X-rays, is not a perplexing one to settle. More and more the general practitioners throughout the state are acquiring their own machines. It is true that many of them are of an old type, yet with the help of a competent technician to standardize the machine and give practical instruction in its proper use, a large percentage of these men can produce diagnostic plates. The Minnesota Public Health Association has employed a technician to go about the state checking up on X-ray machines prior to having plates taken of school children with positive Mantouxs. The results have been satisfactory in most instances. There are available at the present time well-qualified X-ray technicians in the Twin Cities who, for a nominal fee, will come out to your locality and check up on your equipment. This service has been invaluable to many physicians in the state already. You may obtain the names of these individuals by writing to the Minnesota State Sanatorium. Any doctor who contemplates doing follow-up work satisfactorily must have his machine checked and samples of the X-rays which he takes sent to the sanatorium to determine whether or not his plates are diagnostic. It is the consensus of opinion among tuberculosis specialists that flat plates of the chest are sufficient for roentgenological diagnosis of tuberculosis in practically all instances. Fluoroscopic examination, when done by an expert, is certainly of value, but its use in follow-up performed by different individuals is unsuitable. Only in certain instances when there is a question about the findings in a flat plate are stereoscopic views necessary. By standardization of X-ray technique and careful development of the plates, there is no reason why paper plates should not be used much more universally in this type of work. Costs are greatly reduced with little sacrifice of accuracy in diagnosis. Paper plates are being used by prominent physicians in the Twin Cities, county and state sanatoria men, and tuberculosis specialists throughout the country with satisfactory results. Celluloid plates are to be desired when cost does not enter into the situation.

Satisfactory arrangements for readable plates and the cost of these plates is really the crux of the whole situation as far as the doctor is concerned and consequently a definite scheme is necessary for successful attainment. In those cases in which the local community funds are used to pay for the plates, we feel there should be a minimum charge made by the physician. The fee usually charged in survey and follow-up work has averaged approximately two dollars per plate. This may seem small, but in view of the fact that the volume of plates taken will be greater, the ultimate profit will be larger.

The X-ray plates will be sent to the sanatorium and read by a qualified physician trained in tuberculosis work. This service is rendered free of charge to the family physician. Such a method is necessary in order to have uniformity of technique as well as interpretation of serial plates. Roentgenologists are available for consultation on occasional doubtful plates. While this practice adds more plate-reading to our routine work, it has accomplished a great deal of good in getting the doctors acquainted with the tuberculosis diagnostic and epidemiological set-up.

Follow-up by X-ray is the only way to maintain a uniform control of these known and suspected cases. It is certainly cheaper for the county to pay for plates on known tuberculosis contacts among whom about four to eight early adult lesions are picked-up out of every one hundred persons examined, than to wait until many of these four to eight cases break down and require sanatorium care at a cost of approximately $500 per year to the county. By the prompt application of preventative methods to the cases found, the spread from these uncovered cases will become negligible. Large amounts of public funds are being expended for the care of the tuberculous in our state. Would it not be wiser to reapportion this money so that more of it will be spent for the discovery of early cases, with the result that fewer far-advanced cases will develop and require continued expensive care. We can eradicate tuberculosis only by seeking and finding it before it becomes a disabling and killing disease.

Regarding the fourth requirement, there has already been established under the Board of Control at the State Sanatorium a central bureau of records, which eventually will have a record of every case of tubelculosis in the area, as well as a list of all school children with positive Mantouxs. A central record system is necessary for uniformity in follow-up methods, proper tracing of people who move about the state, and for centralization and accessibility of statistical data. From this central bureau, the necessary machinery is set up to locate patients with tuberculosis, and their contacts as well, to see that they get to their family physician for examination, and to see that these same patients and suspected cases are returned at definite intervals for check-up The field work in the forty-six counties is carried on by adding an

epidemiologist and one additional clerk to the staff.

The epidemiological report blank (Fig. 1) contains the data necessary for disposition and follow-up of each family with tuberculosis. Separate cards are used for each successive investigation. The epidemiological file is accumulated through various channels. First, tuberculosis in Minnesota is the only communicable disease reportable by statute. Copies of these reports coming in to the State Board of Health are referred to the Sanatorium for recording and investigation. Second, results of school surveys showing positive reactors and newly uncovered cases are recorded. Data is accumulated for each positive reactor. Third, in family investigations by the practicing physician in which he uses tuberculin testing and X-ray, cards are made out for each positive reactor as well as each new case with lesions present by X-ray. Fourth, positive sputum cases are reported from the Public Health Laboratory, State Board of Health. Fifth, reports on clinical cases discovered in state hospitals, penal and custodial institutions are referred to the State Sanatorium. Sixth, complete records are kept of all cases admitted to the Minnesota State Sanatorium. An alphabetical file of all cases of tuberculosis reported in Minnesota since 1910 has been maintained in the Division of Preventable Diseases.

An alphabetical file and a duplicate calendar file by county, are maintained for obvious reasons. The first file is for identification, and the calendar file is for the purpose of continued check-up at definite intervals in the future. Once a case is investigated it is impossible for it to become lost in the files, because its duplicate in the calendar file will show up at a definite future date for recheck and investigation. When that has been investigated, still another date is set, and so on.

The system used in the follow-up of a new case originating, for example, from the State Board of Health Laboratory's report of a case with a positive sputum, is as follows: A letter is written from the bureau to the family physician (Fig. 2)

FIGURE 2

Dear Doctor:

The Minnesota State Sanatorium, under the direction of the State Board of Control, has established a central bureau of records for cases of tuberculosis throughout the State, so that adequate isolation of all infectious persons and more rapid follow-up of exposed contacts may be instituted.

The regulations of the State Board of Health, which have the force of law, require that all people suffering from the communicable disease, tuberculosis, be cared for in such a manner that they will not endanger the public. This holds true also of all suspected cases, for example, members of a family in which there has been an open case present for some time. This can be accomplished by the prompt isolation of the open or active cases in the home until their transfer to a Sanatorium can be effected; by applying the Mantoux test to the exposed group and X-raying those reacting positive, so completing the initial family check-up.

Please give us the information requested for the required disposition of the case.

1. Are you the family physician for the persons listed below, who are reported as having tuberculosis?.....
   (a) If not, do you know the family doctor's name?.....
2. Is the family of sufficient means so that they might come to you, as private patients, in order that you may explain the communicability and health law requirements of the disease, Mantoux tests for each contact, and X-rays for each positive reactor?.....
   (a) Do you want us to write to these patients and instruct them to come into your office on a certain day?.....
   (b) If not, will you be willing to assist in the follow-up work if the individuals are transported to your office and Mantoux material is supplied to you, free of charge; and arrangements are made for the cost of taking X-ray plates at a minimum price of two dollars per plate?.....
3. Do you do Mantoux tests in your office practice?.....
4. Have you the X-ray facilities necessary to take a flat plate of the chest?.....in your office, or town? (Circle answer.)
5. Are there any other old or new cases of tuberculosis in your practice that we have not listed, which should be followed up?.....If so, please list names on the reverse side of this letter.

Yours very truly,

M.D.

Superintendent.

HAB:ca

FIGURE 1

STATE BOARD OF CONTROL—DIVISION OF TUBERCULOSIS

Walker, Minnesota

Case No.....

TUBERCULOSIS EPIDEMIOLOGICAL REPORT

Family No. F.....

Name..... M. F. Age..... White, Black, Indian, S. M. W. D.

Address.....Village or City..... Twp.....County

Status, is case living and reported—Yes.....No.....Dead and reported—Yes.....No.....Date of death.....

Positive sputum report—Yes.....No.....Date.....Mantoux test—Pos.....Neg.....Date.....

X-ray findings..... Date.....

Relatives or *associates* who *are* or *have been* in close *contact:*

Name	Age	Relation	Address	Mantoux +	Mantoux −	Mantoux Date	X-ray Ch+	X-ray Ch−	X-ray Ad+	X-ray Ad−	X-ray Date	Duration Contact	Possible Diag. Tb. Ch+	Possible Diag. Tb. Ch−	Possible Diag. Tb. Ad+	Possible Diag. Tb. Ad−

Relatives or *associates* with *known* pulmonary *tuberculosis:*

Name	Age	Relation	Address	If dead year	Close contact yes or no	Duration Contact	Duration Tbc.

Is patient isolated at home—Yes.....No.....Or at what sanatorium..... Date.....

If not isolated, *reason*.....Patient's.....Family M. D.....H. O.

Name and address family M. D..... Local H. Officer.....

Reported by..... Date.....

requesting investigation of the case reported and the family. An epidemiological report blank is enclosed. If the family is one of good means, the physician is willing to get the members of the group into his office where he does the necessary follow-up work. He responds in his reply to the letter to that effect. Second; a letter (Fig. 3) is written to the family in which there is a case of tuberculosis requesting them to come in to see the family physician. Appointments are made for the Mantoux testing of all contacts, and at the same time the physician writes in for material for these tests. When the tests are applied and read forty-eight hours later, the physician makes his own arrangements for X-rays on the positive reactors. These plates are forwarded to the State Sanatorium for reading and completion of the epidemiological files. The family physician is sent a report of these readings. If any definite lesions are found in the contact group, a physician examines and records the clinical picture in each case, regarding specifically positive sputum, toxemia as evidenced by increased pulse and temperature, weight, fatigue, complicating and associated extra-pulmonary tuberculous lesions. If there is any doubt in his mind regarding the proper disposition of the case after this period of clinical observation, he is free to consult with the medical staff at the State Sanatorium in order to correlate his clinical and X-ray findings. In this way the best disposition of the case is made.

On the other hand, if the family is poor, the physician will usually respond with the information that he does not have time to investigate the family, but will be glad to apply Mantoux tests or take any necessary X-rays if some arrangements can be made for such. The physician is unable to make this investigation of the family because it not only takes time away from his office practice, but also results in an actual outlay of cash which he has no means of recovering. For this reason the tuberculosis control so far as this family is concerned becomes altogether a community responsibility. Therefore before this family can have follow-up properly carried out, arrangements must be made for transportation of the family to the doctor's office, and for the cost of their examinations. With the combined efforts of the local physician, the health officers, the local and county officials and the school or county public health nurse, together with the epidemiologist assigned to tuberculosis, arrangements can nearly always be made for the follow-up of such a family group.

It is in this part of the work that the public health nurse can play an important rôle. She must have a fair knowledge of the tuberculosis problem and State Board of Health laws relating to it, she must realize that these cases do not always care to be investigated, and in such instances much diplomacy yet firmness must be employed. Above all she must not attempt to take over any of the responsibilities of the family physician unless he directs her to do so in individual cases. If the nurse will always work through the physician as his assistant in carrying out the irksome yet necessary details, nothing but good will result. We feel that the supervision of these nurses must come from the family physician in the community and not from outside sources. This can still be done, of course, along the lines of a definite group plan.

As a last step in the actual performance of the follow-up, at the time the case is completed a future date is decided upon in each individual case for the next check-up, and the completed epidemiological card is set ahead in its proper place in the calendar file. When the time comes for the next check-up, a similar procedure is repeated, and satisfactory supervision is maintained. In the current inventory of the calendar file, the doctors and the patients are reminded of the next follow-up time.

What disposition is made of the new positive sputum case that is discovered? The law requires that every case of tuberculosis be reported to the State Board of Health. The regulations of the Board of Health, which have the force of law, require that all people suffering from a communicable disease be cared for in such a manner that they will not endanger the public. This is also

FIGURE 3

Dear Sir:

The Minnesota State Sanatorium, under the direction of the State Board of Control, is establishing a follow-up record on each family in which there has been a case of tuberculosis reported, so that unrecognized cases may be brought to light early and consequently prevented from becoming more serious. This work is all done, of course, through the family physician, and is strictly confidential.

The regulations of the State Board of Health, which have the force of law, require that all people suffering from the communicable disease, tuberculosis, be cared for in such a manner that they will not endanger the public. This holds true also of all suspected cases, for example, members of a family in which there has been an open case present. This can be done by isolating, under your doctor's direction, the open and active cases in the home until their transfer to the Sanatorium can be carried out. All exposed members of the family should have the Mantoux test, and the positive reactors should be X-rayed.

Please go in to see Dr.....
at....., Minnesota, on any.....
(day) in the.....(A. M. or P. M.) at your earliest convenience so that he may send us a full report on individual members of your family.

If, for any reason, you are unable to do this, let us know in order that the local health officer or our state epidemiologist, assigned to tuberculosis, may go over the situation with you.

Yours very truly,

M.D.

Superintendent.

HAB:ca

true of tuberculosis suspects, for example, members of a family in which there has been an open case present for some time. The effective handling of a newly-reported positive sputum case under these conditions requires isolation. Such isolation should be instituted at once at home preparatory to the patient's removal to a sanatorium, which should be at the earliest possible moment since the continuous home care of the patient in the carrier stage is not practical and is seldom safe for others in the home. During this interval between the time of the diagnosis and the patient's removal to a sanatorium, the physician should be authorized by the county to make visits at the home in order to supervise the treatment of the patient, and to aid in carrying out the isolation technique in the family group. By the use of a classification based on epidemiology and control, rather than clinical symptoms alone, it is altogether possible to emphasize the necessity of positive sputum, as well as definitely progressing cases being admitted to the sanatorium with the least possible delay. Whereas other cases which are not yet distinctly a public health menace in many instances might well be delayed, thus giving the community a good deal of protection on the one hand ,and saving them considerable money on the other.

When a positive sputum case has been sent to the Minnesota State Sanatorium for care and treatment, therapy is instituted to render each patient free from tubercle bacilli and to control toxemia. As soon as this is accomplished, the sanatorium staff is ready and anxious to return the patient to his family physician for continued treatment providing the doctor is desirous and capable of doing so, In some instances the patient is receiving pneumothorax therapy. Here again the opportunity presents itself for the doctor to rightly take the initiative in tuberculosis control work. If he has not yet acquired an understanding of the indications, technique, contra-indications, and complications of pneumothorax he should make this fact known to the staff of the sanatorium so that arrangements can be made for him to obtain this valuable adjunct to his therapeutic ability. If the physician does not care to do this work himself, he can name one of his colleagues in the vicinity to render this service to his patients. Collapse therapy can be done in the office, and in most cases must be continued over a period from two to five years at one to four week intervals.

County authorities are usually quite willing to pay the local physician $5.00 for re-fill once or twice a month rather than the $45.00 per month that would be necessary to occupy a bed in a sanatorium for treatment of an ambulatory patient. Arrangements are made for this reapportionment of funds before the patient is discharged.

The most noteworthy point in this method of decentralization of care is that the family physician retains control of the patient, and gets paid adequately and promptly for his medical services. It is only a step further to continue the work and check up on the whole family group.

At regular intervals the family physician reports on the progress of the case to the Superintendent of the State Sanatorium. If at any time trouble arises, he has recourse to consultation with the medical staff of the sanatorium.

The cost of pneumothorax equipment is comparatively small. A good outfit can be made up in your own work-shop with the aid of a local mechanic. At any price it is a good investment.

This procedure for handling discharged ambulatory patients is being carried out effectively in many counties of the state, and has been since 1932. When you are contacted, as an individual physician, regarding this follow-up treatment of one of your patients, it is essential to the successful carrying out of the plan that you prepare yourself to render up-to-date therapy to this patient.

It is always difficult to know just where to start and what to do first in order to get a plan of such proportions functioning actively. What does the doctor do when he wants to follow up a family in which active tuberculosis cases are known to exist, or when he desires to make a survey of the school children in his community? It is here that the epidemiologist can be of real value and assistance. When a problem in tuberculosis work comes up in your practice which you do not know exactly how to handle, write to the Minnesota State Sanatorium, and we will be glad to advise you and, if necessary, send an epidemiologist to assist you in carrying out details. Inquiries are coming into our office daily for advice, aid and materials for Mantoux testing. The epidemiologist visits as soon as possible the doctor who has written in, and outlines the plan, familiarizes the physician with the laws regarding tuberculosis, demonstrates the application of the Mantoux test, and, forty-eight hours later, the detection of a positive reaction. Then the epidemiologist assists in arranging for X-rays, standardization of materials and cost, interviews as an official of the state the school superintendents, city and county officials, and county health agencies. When families with tuberculosis in the community do not cooperate

with the local doctor, the epidemiologist in consultation is often of service in persuading, forcibly if it is deemed necessary by the family physician, the family to come in to be checked up. An ideal situation for follow-up arises in a community after a Mantoux survey has been done in the schools. It is very simple for an enterprising physician with a little public health consciousness to go before the school administration or authorities with the suggestion that all children over ten years of age should be tested because of the fact that there are known cases of tuberculosis in the community and children from these families are in the schools. Soon the Parents and Teacher groups, the Legion Auxilliary, and other lay organizations will become interested, and one or two discussions before these associations by the local physician will break the ground for a far-reaching and profitable project in tuberculosis control.

We have assisted and have been assisted by the Minnesota Public Health Association in their surveys throughout the state. The epidemiologist usually goes into the community when the survey has been completed to assist the physicians in the actual carrying out of the follow-up work, not only on the cases uncovered by the survey, but in all reported cases in the vicinity. Eventually the epidemiologist will have visited every interested physician in every locality in the area, and started him off on a definite program of follow-up as it relates to that particular community. A coordination of all these forces used in control measures is necessary, and the epidemiologist is qualified to handle this matter along with the gathering of complete records and the assisting of physicians in establishing their offices as stations of tuberculosis control.

SUMMARY

It must be repeated that the successful development and culmination of the plan will depend immeasurably on the enthusiasm and willingness of the physicians to participate in carrying out their part of the work. It is an ideal set-up for the practicing physician to utilize in the rural community. He should get in early on the epidemiological control of tuberculosis because we know that tuberculosis is going to be controlled. The work of Dr. E. J. Simons in one rural community is ample proof of what can be done by a country practitioner who enters into the true spirit of the work. If the family physician is too easy-going to take the initiative, lay public health workers will be forced into this field. For the preservation of the true status of the general practitioner this should not be permitted to occur. The rational thing for every doctor to do is to make himself a deputy health commissioner in his community and have the official health agencies only for the purpose of assisting in the follow-up of his patients, and also to back him up with the proper authority in health matters whenever necessary. This gives promise of being a salient factor in every physician's successful medical practice. If patients are forced to go to outside sources for the care of one type of disease, they, as well as other members of the family, will go for other types as well. This has certainly proved to be true of tuberculosis. Therefore every practicing physician must sooner or later enter into public health work to maintain the full integrity of his profession. It is time that we physicians concentrate our efforts on the control of tuberculosis in humans as veterinarians have so ably done in cattle. It is a reflection on the medical profession that we have allowed the doctors of animals to forge ahead of the doctors of human beings in the field of tuberculosis.

This situation has a direct bearing on the members of our own families when the fact becomes known to us that even our teachers are not certified to be free from tuberculosis. We should insist not only as doctors but also as parents that all our school teachers and students in teachers' colleges be examined for tuberculosis before they are entrusted with the care of our children.

At first the results may be slow in materializing for tuberculosis is not a disease like diphtheria with a short life history. It does not take long however before financial returns are evident, professional knowledge is advanced, and professional prestige and power are evidenced in the health matters of the community. By decentralizing the accepted method of handling the whole tuberculosis load from the sanatoria to the local doctors, retaining only those in the sanatoria who must remain because they are a public health menace, or because of the fact that their tuberculosis has made a domiciliary existence necessary, we hope to convert a major part of the tuberculosis problem into one of largely epidemiological importance. In this manner the local physicians and the county authorities may work out many of their tuberculosis problems together, keeping much of their money in the community, and obviating the necessity of the sanatorium serving the purpose of liaison officer between these two citizen groups at a distance. This will automatically cause a reapportionment of the funds used for tuberculosis control. What is more beneficial or appropriate than to turn some of these funds into the coffers

of the general practitioners who constitute the biggest charity institution in the state? The physician, with the plan formulated, can actually practice the art of medicine and be paid for his services, and also be the official advisor and director of the health of the community, as it relates to tuberculosis.

The Minnesota State Sanatorium is not only an institution for the care of the tuberculous, but also a cooperating public health agency working with all other institutions and agencies whose chief duties are to offer therapeutic relief to cases in need of treatment and separation from the contacts. The Sanatorium further cooperates with the family physicians and county officials to the end that cases of tuberculosis that are not a public menace may be cared for at home at a greatly reduced cost.

This plan is being presented in order that physicians throughout the forty-six unorganized counties may become acquainted with it, and interest and prepare themselves to participate in the successful working out of the program. The personnel of the Sanatorium, including the epidemiologist, is available at all times to assist in planning and executing control problems as they develop in individual communities.

The plan as outlined was initiated at the Minnesota State Sanatorium in November, 1932. The value to the state of this preventative work is of equal importance to the work carried out in the Sanatorium itself. The relative cost is less than one to ten in favor of epidemiological control, with the promise of eventual elimination of the more expensive component through the development and application of the more economical method.

At the present time the plan is working out effectively, and considerable data is accumulating from the large area tributary to the Minnesota State Sanatorium. A statistical analysis is now in progress to determine with what effectiveness this end will be accomplished. All that is necessary now for the complete success of the plan is that the remaining physicians who are not already actively engaged in the diagnostic, therapeutic, and epidemiological control of tuberculosis, prepare themselves to enter this field in their respective communities.



Adjusting College Informational Hygiene to Various Grade Levels*

A. O. DeWeese, M.D.†
Kent, Ohio

INFORMATIONAL College hygiene has, for the past several years, vitally engaged the attention of everyone interested in Student Health Work. Its thoughtful study, and its introduction into the College curriculum has presented at least four very definite major problems.

The first problem was how to get those courses in informational hygiene, giving the essential preparation for modern life on the part of the college and university trained populace, included in the required courses of the college curriculum. In the evaluation of subject material for required college work, administrators were not easy to convince that informational hygiene was essentially important. Some even doubted if there were sufficient material of college grade in such courses to justify college credit. In a few colleges this problem has not as yet been solved.

The second problem grew out of the first—i. e., what should be included in such required courses; what should be the qualifications of the teachers, and the minimum semester hours needed to present the material. These questions were answered as satisfactorily, perhaps, as it is possible at the present time, by the last National Conference on College Hygiene. This conference, indorsed by and participated in by our organization, outlines in a general way the essential material and objectives of such a course, the qualifications of the teacher, and sets the minimum allotted time for such a course at two semester hours.

The third problem was what would be the best departmental organization to teach the informational hygiene. Should it be a separate department? Should it be combined with another department, and if so with what department? Close perusal of the proceedings of the American Student Health Association shows that the studies made and presented by this organization indicate that hygiene instruction should be under the direction or closely allied with the Student Health Service.

The fourth major problem was how to adjust Informational Hygiene teaching to the various grade levels of college. Practically all of the studies that have been made show that there is a wide variation of grade levels among our college and universities' students. These variations are not only in the hygiene information possessed by the students, but also in their health consciousness and philosophy of healthy living. These variations are so wide that obviously it would be poor pedagogy to attempt to present the subject material at the same level. The problem then is how to find and establish these various grade levels. A survey of our colleges and universities shows that three definite plans have been tried.

The first plan is the standardized objective placement tests. For the past several years the American Student Health Association has developed, accumluated and presented such tests, and under the able leadership of the Chairman of the Committee has made a definite worth while contribution to this important educational movement.

The second plan is to make the various grade levels in accordance with the student's scientific background, as judged by definite college courses in science that he has completed. Hygiene is an applied science. College students will, therefore, approach it at as many grade levels as their scientific backgrounds present.

The third plan is based upon the student's scientific and professional interest. This scientific and professional interest is elicited by the course he elects and the majors he pursues. The proponents of this plan believe in professionalized subject matter and hold that the most logical division is that of individual and professional interest.

Which is the best plan to use in adjusting informational hygience teaching to the various grade levels? The answer possibly is that no one plan should be used to the exclusion of the others. A combination of all three plans may be the most satisfactory solution. Again there is the possibility that the conditions are so varied in the different colleges and universities that one plan would be the best for one and another plan best for another.

To illustrate how these problems may be met let us present the organization as found in one school, a type of the smaller college.

The organization of the Health Education Activities in the Kent State College is not presented as a model or ideal. There are many things

*Read before the fourteenth annual meeting of the American Student Health Association, Chicago, December 29, 1933.

†Director of Health, Kent State College.

in it that we would change ourselves if we could. It merely represents the most practical organization that one college has been able to work out of the present complex nature of Curriculum construction.

It does not differ from any other college as regards the variety of theories of curriculum construction held by members of the faculty, as regards prejudice in various departments, or notions and opinions on the part of the deans and administrative officers when it comes to evaluation of subject matter. But it does have the advantage of possessing a president who is health minded, and who employs modern scientific and professional views in discussing health education.

The institution represents that type of small college with an enrollment of over one thousand. It offers the usual liberal arts degrees of A.B. and B.S. with majors in music, art, home economics, commerce; the usual pre-professional training in law, engineering, medicine, dentistry, and the professional degree of bachelor of science in education.

The two most significant advantages that it has, as we see it, are:

1. Every student in the college is required to take formal instructions in Hygiene.

2. All of the health protection, health giving and health education of the college is organized in one department under a Director of Health.

The American Association of Teachers Colleges issue a printed list of standards for accredited colleges. In Article IX, entitled Student Health Service and Living Conditions, we find that the health activities are organized under the general headings of health protection, health education, physical recreation, and living conditions. Under health protection it states that provisions shall be made, by means of suitable organization, for the following phases of student health service: (1) physical examinations, (2) consultation on health matters and dispensary treatments, (3) correction of remediable defects, (4) hospitalization or infirmary care. Under health education is stated that student health service logically includes health education, and that, hence, suitable courses in health education shall be offered. Under physical recreation is stated that facilities shall be provided for indoor and outdoor recreation involving desirable physical activities. Under living conditions the requirements are outlined for proper provisions for suitable living conditions, construction and sanitation of dormitories with provisions for their supervision.

The efficiency and the advantage in having all of the activities, as here outlined, organized under one department with a Director of Health responsible for their execution is, we believe, quite obvious. The personal hygiene instruction begins with the "freshmen week." Each student is given a personal hygiene score sheet with which he scores himself before he takes his physical examination. In individual and group conferences, the student's personal hygiene and physical examination findings are discussed. Those students who are found to be in need of special attention regarding personal hygiene or physical condition are assigned to corrective classes in physical education. Here their supervision is simplified by the fact that the physical education work is directly under the supervision of the Director of Health.

The formal class room course in informational hygiene is begun regularly in the second year. In some instances it is postponed until the third year. There are four of these courses. The content of each course follows closely the recommendations made by the last Conference on College Hygiene. They differ mainly in the emphasis placed on the informational material, the scientific background of the material presented, the co-ordination with physical, biological and social sciences, and their philosophical aims.

These required courses range from two to six semester hours. The course the student pursues is determined by the following factors:

1. The majors he selects.
2. The avocation or type of course he elects.
3. The science courses he successfully pursues during the first and second year.

To illustrate: Students who are majoring in education for elementary teachers are required to take two hours of physiology and three hours of psychology during the first year. This is followed in the second year by three hours of science and three hours of informational hygiene, with the emphasis on child hygiene.

Students who are majoring in education for secondary teachers are required to take six semester hours of biological and six hours of physical science in the first year. This is followed in the second year by all (except those who major in hygiene and physical education, or science) by four hours of informational hygiene with the emphasis upon school hygiene. Those who major in hygiene, physical education or science will carry additional courses in science during the second year. Their hygiene is therefore postponed until the third year. Here they have six hours of informational hygiene, with emphasis upon the underlying physiological basis.

Students pursuing the regular cultural liberal

arts course are required to have in their lower division work a year of biological or physical science. This is followed in the second year by two hours of informational hygiene. On the other hand, the students who are looking forward to medicine, dentistry, social service or nursing have to elect more science courses in the lower division, and their hygiene is postponed until the third year. Here they have six hours of required informational hygiene with the emphasis upon the underlying scientific basis.

Thus the student's scientific background, as judged by the particular college courses in science he successfully pursues, and his professional interest, as elicited by the course he elects, are used to determine the grade level for his required hygiene instruction instead of the more orthodox plan of grading them all by the placement test.

We, of course, believe in placement tests, and are highly appreciative of their educational value. We use them as aids and supplements in special cases, but do not rely upon them solely in determining the grade level of hygiene instruction the student should have. When the student desires to take some course other than the prescribed one, the transfer is made only after a personal interview and placement test. The same procedure is used in the case of students transferring from other colleges.

It so happens that when we consider the scientific background of the student as determined by the science courses they have successfully pursued, and their professional interest as elicited by the course they elect, we have them classified in about equal divisions with a suitable number for each class. If it were necessary to form more than one class of either division, the placement tests would be used. If, on the other hand, our students are all pursuing the same courses with the same objective of only a liberal, cultural education, the placement tests would be used mainly in their classification of hygiene courses.

We are not, however, fully convinced that there are not many other factors of as much importance in the classification of students for various levels in hygiene as the placement tests. If we were inclined to become too enthusiastic about modern educational testing and were prone to rely upon them too heavily, we should want to study more carefully the new educational book, "The Educational Frontier." This book is a challenging, constructive discussion of the evils of our educational system, by seven noted educational authorities, namely, Kilpatrick, Bode, John Dewey, Childs, Hullfish and Thayer. Quotations from this source are as follows:

> "With the coming of the war, the psychologist's science was thrown into the common cause. The army intelligence tests marked an epoch in the rise of the testing movement. Psychology came to be recognized as a science which might well be of assistance in any cause having to do with persons where differences of ability were of importance. In education, ability grouping came to be instrumental in furthering the cause of efficiency in academic mass education. Advertisers have capitalized the psychologists skill, and insights into people's responsiveness to the stimuli of their various wares, and the list could be extended. Throughout it has been a study of the individual, as such, and the ends served thereby have been matters of least concern, for is not this, after all, the essence of exact science, that it be impartial.
>
> The conclusion must be clear that such a psychology yields little help, is perhaps rather a hindrance to our understanding of the purposeful behavior of people. The ends served by it are essentially static ends, for such is usually the result of "impartial" science which refusing to criticize ends; thus accepts those of the status quo, and the objects of its study are thus usually those which have least to do with the way in which a people moves from one social culture form to another, from one end or goal of common living to another."
>
> "Administrative functions have been developed that place a premium upon teaching which successfully fixes the terms, and our scientific development in the field of the measurements of results has glorified both the administrator and the teacher whose activities bring large masses of students quickly up to the informational levels which the tester, assuming that informational accumulations set the ends of education, has established. All of this may be splendid for the administrator and thrilling for the tester; but we are beginning to realize what we should always have known, that it is deadening and fruitless for both the student and teacher."

Safety in College Sports*

Floyd R. Eastwood, M.D.†
New York, N. Y.

THE survey of college sport accidents recently completed is the second in a series of three. These studies have been carried on through the co-operation of the School of Education, New York University and the National Bureau of Casualty and Surety Underwriters.

The first study completed in October, 1932, by Dr. Frank S. Lloyd, was made on the secondary school level.‡ The second study by the writer surveyed physical education accidents during the academic year of 1932-33 in college, covering both men's and women's sports. The third in the series will be launched on the elementary school level in the near future.

Scope of the Study

Seventy-five women's colleges with a population of 74,225 students reported 507 accidents and 1,723 absences from physical education classes. Thirty-eight men's institutions having an enrollmen of 68,472 reported 888 accidents and 1,367 physical education class absences. In addition to the year around study, an intensive survey of college football accidents was made during the fall of 1932. The seasonal study covered 157 colleges with an enrollment of 131,416. These institutions reported 1,836 accidents and 14,396 football practice periods lost. Colleges were sectionally located in each of the three surveys.

Sport Accidents by Season

A. *Women:* Field Hockey, riding and soccer have the highest accident incidence in the fall. During the winter, basketball, appartus and dancing are high, while games and relays, indoor baseball and swimming and diving rank highest during the spring season.

B. *Men:* Football had the highest accident incidence in the fall, followed by soccer, touch football, and boxing. In the winter season, wrestling, basketball and apparatus ranked highest while during the spring, baseball, lacrosse and track events reported the greatest number of accidents.

*Read before the fourteenth annual meeting of the American Student Health Association, Chicago, December 29, 1933.
†New York University.
‡Frank S. Lloyd: Study of Safety in Physical Education in the Secondary Schools. National Bureau of Casualty and Surety Underwriters, New York, 1933.

Type of Period During Which the Accident Occurred

Class Instruction: The greatest number of women's accidents occurred is while engaged in basketball, field hockey and apparatus. Wrestling, basketball and boxing accidents reported the highest accident incidence during the men's class instruction period.

Intramural Periods: Women's accidents occurred more frequently in field hockey, basketball and indoor baseball, while the men's sports reported football, basketball and wrestling.

Intercollegiate Practice: Field Hockey and basketball are the sports more often incurring injuries in women's intercollegiate practice, while the men report more accidents in football, wrestling and basketball.

Intercollegiate Competition: Women's basketball and field hockey result in the greatest number of accidents in intercollegiate sports. The highest accident incidence for men was in wrestling, basketball, and track and field events.

Unsupervised: The women's sports incurring the greatest frequency of accidents during this period were basketball and riding. The men were injured more frequently playing handball, touch football, basketball and working on the apparatus.

Classification of Sports by Degree of Hazard

Many times it is unfair to a sport to classify it only by frequency of accident, to obliate this, a per 1,000 exposure rate was computed from figures reported in the questionaire, thus each sport was compared in light of the number out for the activity. This descriptive grouping locates the hazardous sports more definitely, and makes figures comparable with other accident rates.

The *very hazardous* women's sports were apparatus and riding, the men's football, horse polo and wrestling.

Sports classified as *highly hazardous* for women were field hockey, basketball and soccer; for men, lacrosse, soccer, crew, boxing, touch football, cross country, heavy apparatus and baseball, were highest in accident and days lost incidence per 1,000 exposures.

Part of Body and Nature of Injury

Sprains, and dislocations of the ankle, hand

and knee occur more often with women in sports, while men have more joint sprains, to the ankle and knee and lacerated or contused wounds of the face. In football joint sprains to the knee, ankle and shoulder occur most frequently.

Designated Causes of Accidents

Women: The causes of accidents most frequently mentioned were: struck by piece of play equipment, collision with other players and falling or slipping.

Men: The stated causes for men's accidents which were reported most frequently was; unavoidable, collision with another person, and falling or slipping.

Football: Most of the football accidents were reported as unavoidable, collision with another person, or unnecessary roughness.

Contributory Causes of Accident

Women: (1) The accidents and days lost per 1,000 exposures is reduced in 98 out of every 100 cases where a *physical examination* is given before the student is allowed to enter intramural competition. (2) The teacher with less than three years of *experience* has a slightly lower mean number of accidents per 1,000 exposures than those with more than three years of experience, (in 98 cases out of every 100). This may point toward an improved emphasis on safety during the training period of the more recent graduates. (3) *Indirect safety instruction* reduces the days lost in 94 cases in every 100 while direct safety instruction has a higher days lost exposure rate. (4) The best procedure in *reporting accidents*, if days lost are to be mimimized, is to send a written report to the chairman of the department. (5) In order to reduce the days lost incidence per 1,000 exposures the college administration should *pay all injury costs.*

Men: (1) The best procedure in cutting down accidents in intercollegiate competition is to have either the coach *select the squad* or to have the individuals selected through proficiency is intramural games. (2) The family or school physicians opinion proves to be better in the matter of *excusing* individuals from physical education. (3) An *examination* by family doctors or a required college physical examination is the best procedure to follow when determining a student's fitness for intramural competition if the accident exposure rate is to be lowered. (4) The *use of student leaders* reduces the accident exposure rate. Where they are used for the entire class instruction, the accident and days lost incidence per 1,000 exposures is further reduced. (5) *Indirect safety instruction* is more valuable than direct instruction in reducing the accidents per 1,000 . (6) The days lost incidence is materially reduced if a physical educator or doctor renders *first aid*, rather than a student. (7) A *doctor available* at all intramural and intercollegiate, games and practices, reduces materially the days lost incidence. (8) A *required physical examination* before participation in class instruction, intramural and intercollegiate periods reduces the accidents and days lost mean incidence. (9) Where the college administration pays part of the *costs of injuries* or the college athletic association pays all, the mean days lost from injuries is reduced.

Football: (1) Four weeks of *training* gives the lowest mean number of accidents. (2) Six to eight days of *practice* before the first scrimmage is the best procedure to follow in reducing the number of days lost per 1,000 exposures. (3) Two days of *fundamentals* per week reduces the number of days lost. (4) Where not more than 30 minutes is devoted to *scrimmage* the accident incidence per 1,000 is lowest. (5) If a complete *medical examination* is given before the first game both the accident and days lost incidence is reduced nearly in half. (6) Where the college athletic association pays all *injury costs* the days lost incidence is materially reduced. (7) At least four years of *coaching experience* is necessary to reduce the days lost incidence per 1,000 exposures. (8) The coach with only one years *experience* has the highest accident incidence. (9) The coach who is *hired for football* and some other sport has the lowest days lost incidence per 1,000 exposures.

Diffuse Scleroderma, Dermatasclorosis, Hidebound Disease

L. J. Pankow, M.D.
Sioux Falls, S. D.

Report of a Case

Scleroderma is defined as a disorder characterized by a board-like hardening of the affected skin, with immobility of the part. It being a rather uncommon condition, and being interesting to me, it was deemed that it might be of interest to others, and I have, therefore, written this very brief summary of the diffuse type, with a report of one case.

There are three types of scleroderma, two of which are distinct. They are the diffuse and the circumscribed forms. The third type is an apparent combination of the two. It has been suggested that the so-called "white spot disease" may be a form of skin affection closely related to scleroderma.

The diffuse type, of which this case is one, is usually found in adults, most often in the third or fourth decades of life. There seems to be a slightly greater number of cases reported in females than in males. I suggest that this may be due to the fact that women are more apt to report to a physician with such a condition than men. When seen, these cases frequently give a history of recent exposure to dampness and cold and may be accompanied by rheumatic manifestations. The areas usually develop rather slowly, and when seen early the skin looks quite normal, but the feel is very characteristic. It may pit slightly, feels hard and waxy, and is very smooth, the normal wrinkles of the skin being absent. The areas involved vary as to size and shape, but the sites of choice are the face, neck, upper torso and arms. Sensation is usually affected some. There may be either a hypo- or a hyper-thesia present. Later the skin becomes hard with an ivory yellow appearance, and a very firm adherence to the underlying tissues.

The etiology of scleroderma is unknown. There are several factors that are believed to have some bearing on the condition, but as to definite causes we are still in the dark. It has been pointed out that in some cases there is a definite endocrine upset of some sort or another, usually the thyroid or the ovaries or both being at fault. The adrenals have been suspected, due to the fact that some cases seem to resemble slightly an angioneurotic oedema in their early stages. Nerve trauma, as exposure or other injury has been suspected in other cases. The distribution on the body, being usually quite symmetrical, suggests a circulatory neuro-nutritional disturbance. Focal infection must be considered, as some cases have been benefited by clearing up foci.

Pathologically there is found a hypertrophy of the subcutaneous connective tissue, which progresses to the point of producing a pressure atrophy of the subcutaneous nerves and blood vessels, which results later in an atrophy of the skin. Generally there is considerable lymphoid infiltration.

Treatment has of necessity been rather empirical. Usually thyroid extract, ovarian substance, massage and removal of foci is about the extent of therapy tried.

On February 6, 1934, O. D., female, age 37, married, came in complaining of an increasing hardness and swelling of the skin of the upper portion of her body. The following history was obtained: Past diseases: Usual childhood diseases. Otherwise the past history is essentially negative. On December 18, 1933, she fell on the ice, and fractured the tip of her left elbow. This healed very promptly, and there has been no apparent ill effects from that. Early in January of 1934, she noticed that the skin of her neck seemed swollen and tight. At times it bothered her in breathing. There seemed to be a drawing up of the skin of her chest and she found it difficult to turn her head, or to extend her neck. There was no pain or any other symptoms. She gave no history of exposure or other injury than the elbow fracture.

About January 6th, 1934, she noticed that the neck seemed quite swollen and tight. There was no pain whatever, but after a few days there was a definite discomfort of stiffness in the neck and jaws. The skin seemed tight over an apparent underlying swelling, and there was a drawing sensation up from the chest to the neck. There was at no time any pain accompanying this condition, and she did not report to me until about a month after the first symptoms were noticed. At this time it was observed that the skin over the major part of the upper torso was involved. The breasts were very definitely hard and firm, touching them giving the feeling of a very much

engorged lactating breast, except that the skin could not be moved over the underlying tissues at all. There was no soft areas of skin over the entire chest, shoulders, neck, back to the waistline, the arms to well below the elbows. The distribution was symmetrical. It was with considerable difficulty that she could completely flex the arms at the elbows, rotation of the head on the neck was limited appreciably, and the jaws could be opened only to about a third of the normal extension. There was no definite line of demarkation between the affected and the normal skin. There was no demonstrable oedema, and in appearance the skin seemed normal. It had, however, a waxy feel, similar to the feel of a new kid glove stretched tightly over the closed fist.

Laboratory findings were non-illuminating. The Wassermann test and the Kahn reaction were negative for Lues. The blood showed 77 per cent haemoglobin, 4, 190,000 reds, 7,750 whites, with 76 per cent polymorphonucleated cells, and 22 per cent lymphocytes, with 2 per cent eosinophyles. The urine was negative. Although this patient was and is definitely chunky in build and shows no other evidences of hyperthyroidism, two basal metabolic rate determinations at five-day interval, gave a plus 29 per cent and a plus 30 per cent, respectively. An X-ray of the sella tursica showed a "sella small but negative to bone pathology."



The diagnosis of diffuse scleroderma was made, and empirically, five grains of whole ovary, and small doses of adrenalin solution by mouth were administered three times daily. Massage with an electric vibrator daily, was taken at her home. Later the solution of adrenalin was changed to five grains of the adrenal substance, as prepared by Burrows, Welcome & Co.

There has been, in general, some definite improvement, although the condition has not entirely cleared up by any means. There has been no general softening of the entire affected area, but the margins of the diseased skin seems to have retracted both from above and from below. The elbows are, at this time, freely flexible, and the neck is much less stiff. The area does not extend as far down over the chest or back as formerly, but in the areas still involved there is no appreciable alteration in the appearance or feel. There is no apparent atrophy of the skin at this time. It appears that for no apparent reason there are days that there is greater softness of the skin than others, and that on some days there is greater stiffness of the skin. This does not seem to have any relationship to anything that can be definitely traced, although, on one occasion after great sexual excitement, with no orgasm having been experienced, there was a very definite increase in the severity of the tightness of the skin over the neck and chest.

In the accompanying photo of this case, I have attempted to show how the skin folds in deep cracks and folds, as well as the fine, hard wrinkles which show up best on the right side of the mid line. A picture of this condition, however, is of very little help in the diagnosis, as that is made almost entirely by the feel of the skin.

For information on this condition, I am indebted to the text book, "Diseases of the Skin," by Sutton, and to a very kind answer to an inquiry, from Dr. H. G. Irvine, of Minneapolis.

The
JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA, *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

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South Dakota State Medical Association
The Hennepin County Medical Society
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The Soo Railway Surgical Association
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84 South Tenth Street, Minneapolis, Minnesota

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MINNEAPOLIS, MINN., JULY 1, 1934

ARTHRITIS

Some years ago an able associate stated that the best classification of the arthritides was a simple grouping under the heading "Acute and Chronic." This seemed at the time a feeble gesture, but recent trends of medical opinion point to the observer's acuteness.

In general, acute joint conditions clear up, leaving unimpaired members; the chronic run their courses to various ultimate inadequacies. The potentialities of these terminal states, rather than what actually happens to the average arthritic patient, are what give the term "arthritis" such an odious reputation. The term should be used guardedly. The physician with a good "personality" may well provide an interpretation which his "intellectual" capacity would never gleam from the most sumptuous accumulation of our present-day knowledge.

Cecil* in a recent discussion made this very suggestive statement: "Let us begin with the assumption that rheumatoid arthritis is an infectious disease." Then he proceeded to a very intelligent analysis of constitutional diatheses, temperament, sex, familiar trends, distribution, Climatology, diet and temperament. He implied that the average chronic rheumatoid arthritic is a female, about 35, tall and spare, somewhat dour and independent, more than the average in intelligence, and—need he have said it—a spinster. This social status is one of her own choice and cannot be attributed to her unhappy joints. This is introduced not as a facetious comment but to divert attention away somewhat from one and two dimensional etiology that finds it difficult to accept chronic arthritis in any approach other than an offending coccus and its implacement in a standard human economy.

Efforts to promote blood flow by surgical attack on the sympathetic enervation have at least proven a kinship between the painful episides of peripheral vascular disease and certain painful stiffened joints. Colloidal sulphur† has been tried and approved likewise in these two apparently widely divergent states. The action promoted appears to be better or more complete cellular oxidation and the avoidance of noxious intermediary substances. These suggestions may not prove to be final therapeutic triumps but they are among the solacing antidotes to the widely diverging methods of desensitization and shock —the best accepted rationale of vaccine treatment. Few feel like ignoring "focal infection," but even as close a student of this field as Cecil is nt convinced that "focal infection is found in time to render its eradication helpful;" and as for vaccines, he is non-committal.

*Recent discussion on rheumatoid arthritis before the American College of Physicians' meeting, Chicago, April 16, 1934.

†Senturia, Ben D.: "Results of Treatment of Chronic Arthritis and Rheumatoid Conditions with Colloidal Sulphur," Journal Bone and Joint Surgery, Vol. XVI, No. 1, pp. 119-129, January, 1934.

E. L. T.

WHEN THE EAGLE SCREAMS

Today, right now, let every physician in every community sound a warning of the dangers from explosives. We will soon read about the many eyes that were blinded and the lives that were lost through the hilarious recklessness of patriotic celebrations on the Fourth. May we not feel then that some of these could have been prevented by timely advice from us?

It is not sufficient that admonishment has been voiced in the past. Each year brings myriads of little tots who participate with enthusiasm and eager curiosity for the first time, and adults must be re-educated to save the children as well as themselves. The dangers of inspecting delayed explosions and suspected duds should be stressed. The practice of holding lighted firecrackers in the hand or throwing them in the air should be discouraged. Powder burns of every kind, even from the tiny cap pistol are fraught with serious consequences.

Those who do not heed when cautioned, we must be prepared to take care of. Every physician must have a feeling on a day like this that at any moment he may be called upon. Each has his favorite remedy for burns but powder burns call for something more than local treatment. A prophylactic shot of 1,500 or 3,000 units of tetanus antitoxin may save a life endangered and the doctor's peace of mind.

A. E. H.

CHEST SURGERY

About thirty years ago, when attending clinics in London, the writer was very strongly urged by W. H. A. Jacobson, the senior surgeon at Guy's Hospital, to visit Glasgow and see the work of Sir William McEwen who had just recently performed the feat of extirpating the apex of one lung for tuberculosis, at that time a pioneer accomplishment which attracted the attention of the entire surgical profession.

This little incident is recalled in connection with the recent death, sudden and untimely, of Carl Arthur Hedblom, also a trail-blazer in the field of chest surgery and it illustrates how modern a thing is the development of this branch of surgical accomplishment. Until comparatively recently the only operations regularly done on the chest cavity were the drainage of pleural empyemata.

To Sauerbruch should undoubtedly be given the lion's share of the credit for initiating and stimulating much of the interest which has arisen in connection with this important branch of surgery. Many will recall his appearance before the 1908 meeting of the American Medical Association and the epochal discussion which took place at that time. In this country the name of Willy Meyer will always be associated with the early advances and progress in this work. Fundamentally, of course, the evolution of precise x-ray diagnosis has been the greatest single factor in making possible the utilization of surgery for the relief of various types of intrathoracic lesion.

So far the attack has centered largely upon the infective and benign lesions. With improved methods of diagnosis, refinement of technique and the accumulation of experience the results have been most encouraging, so much so that the field is now being widened to include malignant disease. The undoubted but unexplained increase in the incidence of primary carcinoma of the lung justifies the hope that surgery will be of some avail. So far, at least, the results have been very gratifying. The primary mortality, according to Sellors, is lower than that of the operations for bronchiectasis, due, he thinks, to the absence of sepsis. More time must elapse before we can evaluate the end results.

Chest surgery will never be "popular," if we may use that term in this connection. The diagnosis, the pathology and the surgical technique all require special training and a keen nicety of judgment over and above the normal demand of general surgery. But it has reached the importance of a major specialty, and offers increasingly attractive prospects to those who are fitted to undertake it.

G.C.

Minneapolis Surgical Society

(*Continued from June 15 Issue*)

Radio-sensitive Tumors

Dr. Russell Morse: The various species of cells which constitute the body exhibit a different sensitivity to the effects of radiation, whether X-ray or radium. A tumor arising from a certain type of cell will, as a rule, show a sensitivity similar to that of the parent cell.

Those tumors are truly radio-sensitive which may be made to disappear by doses of radiation which produce no demonstrable change in the surrounding and overlying normal tissues.

Very few malignant conditions can be classified as

radio-sensitive under the strict use of the term, and they are the myelogeneous and lymphocytic leukemias, the lymphoblastomas (whether Hodgkin's disease or lymphosarcoma), the lymphoid type of thymoma, the lymphoepitheliomas of the naso-pharynx, and the metastases from embryonic carcinoma of the testicle.

In the treatment of these conditions the distribution and the dosage of radiation depends upon the type of tumor and upon whether it is a local or generalized malignancy.

The thymomas, lymphoepitheliomas, and the metastases from embryonic carcinoma of the testicle should be treated up to the limit of safety at the first course of treatment in the hope of destroying all of the malignant cells.

Occasionally, after a careful search of the body, a lymphoblastoma appears to be limited to a single tumor which may involve one node or a localized group of nodes. This tumor should be treated adequately at the first course of treatment with the hope, usually false, that the malignancy will not make its appearance in other regions of the body.

Most lymphoblastomas are very clearly a disseminated malignancy and, although the tumor masses can be repeatedly "melted away" by radiation, experience has shown that there is a persistent tendency to recurrence and to the development of new tumors.

Myelomas and lymphocytic leukemias are also to be considered as a malignant process which is widely disseminated throughout the body. The acute lymphatic leukemias usually yield rapidly to radiation of the spleen and bone marrow but the results are only temporary. The chronic lymphocytic leukemias and myelogenous leukemias can be kept under control, sometimes for surprisingly long periods of time, by the use of small amount of radiation of the spleen. Occasionally, however, it is necessary to radiate also the bone marrow in order to secure a satisfactory reduction in the number of leucocytes in the blood and to secure relief of symptoms.

From our present knowledge we believe it is a mistake to treat generalized lymphoblastomas and the leukemias with massive doses of radiation. Our first consideration should be the general health of the patient. We must remember that we are treating an anemic patient with a force which tends to make him more anemic. We should watch the general health of the patient and proceed with the smallest amount of radiation that is necessary to control the disease.

The invariable fatal outcome of the lymphoblastomas and the leukemias should not obscure the really brilliant results we can obtain in preserving the relative good health and activity of the individual afflicted with these conditions. We probably do not even yet know whether we are contributing to a longer life, but we do know that the individual can be kept active and working to within a short time of his death.

Due to the marked sensitivity of the lymphoblastomas and leukemias to radiation, satisfactory results can be obtained by the use of X-rays generated to from 135-150,000 volts and filtered through 4-6 mms. of aluminum. For this reason these malignant conditions can be treated satisfactorily in localities where a machine capable of generating 200,000 volts is not obtainable.

Lymphoblastomas involving the root of the lung may simulate closely a primary bronchogenic carcinoma, both in the appearance of the tumor mass and production of atelectasis. It is well to keep this in mind because radiation will assist in the differential diagnosis and may alleviate a serious condition which might mistakenly be considered hopeless.

Dr. A. A. Zierold: Due to the confusion that invariably attends the assembling of such a program as this, some mistakes of editing have occurred. The name of Dr. Frank Anderson of Deaconess Hospital has been omitted from this program. Dr. Anderson is the Roentgenologist at the Norwegian Deaconess Hospital and has had a considerable experience with deep therapy. I should like this opportunity of asking Dr. Anderson to discuss with you his experience and his estimate of this form of treatment. Dr. Anderson—

Dr. Frank J. Anderson: At the Deaconess Hospital we have a machine which is limited to an output of 180,000 volts. This is not considered sufficient for deep therapy and we have not used it in deep seated cancers but we have used it in the treatment of leukemias, Hodgkin's disease, tuberculous lymph nodes, and following amputation in breast carcinomas. During the past 12 years that I have been at this hospital we have had fairly good results in the treatment of the above mentioned conditions. We have not felt that, up-to-date, we had a sufficient amount of work at our hospital to warrant installing the larger type of machine but may in the comparatively near future.

Roentgen Irradiation of Metastatic Malignancy

Dr. A. A. Zierold: Dr. Walter Ude has for some years directed the Department of Roentgenology at Eitel Hospital. He has at his disposal one of the high voltage equipments and has had opportunity to treat and observe a variety of malignant diseases. I take great pleasure in presenting Dr. Ude, who will speak to you concerning Roentgen Irradiation of Metastatic Malignancy.

Dr. Walter H. Ude: The invitation to appear on this program was extended to me as the roentgenologist of Eitel Hospital. This hospital is one of four voluntary hospitals of Minneapolis who are fully equipped to administer deep roentgen irradiation. It may be of interest to you to know that these four therapy equipments are in actual operation for only a few hours daily, and that their capacity is such that they could take care of from four to six times the amount of work done at the present time. Facilities are therefore available to a marked increase in the amount of X-ray therapy.

The use of X-ray therapy has been gradually extended to include a large variety of conditions of both benign and malignant nature. It is probable that our most satisfactory results are in benign conditions, where a definite objective is usually attained since these cases are practically all carefully selected. During the past year, 23% of our deep therapy at Eitel Hospital was

given for non-malignant conditions, 12% for lymphogranulomata, and 65% for malignant tumors. Carcinoma of the breast, mainly postoperative, accounted for 30% of the entire group, or 45% of the malignancies.

In the treatment of metastatic malignancy, roentgen therapy plays a most important and beneficial part. In many instances it is able to completely destroy skeletal metastases, allowing regeneration of the involved bone and complete restoration of function. In other instances, it may arrest the process sufficiently long to prevent invalidism until metastases to other vital structures lead to a rapid termination of the disease. It may destroy glandular masses to such a degree as to give complete relief from pressure on adjacent organs. In almost all cases it will bring relief from pain.

Metastatic malignancy may be conveniently considered under the following subdivisions: (1) glandular metastases; (2) pulmonary and pleural metastases; (3) liver metastases; (4) brain metastases; and (5) bone metastases. The regional lymph nodes present the first line of defense of the body against the migration of malignant cells, and are therefore the most frequent site of transplants. It is common practice to remove such glands surgically as completely as possible. This should be followed by intensive irradiation in an attempt to destroy any residual tumor tissue, or to confine it to the involved gland by a firm fibrosis. Where such glands are not resectable, they may often be markedly influenced by irradiation. This is especially marked in the case of metastases from embryonal tumors of the testis, or tumors of similar highly malignant type. Large glandular masses in the retro-peritoneal areas can thus be made to completely disappear under intensive therapy. Other more resistant metastases, however, may be influenced very little by such treatment.

Pulmonary and pleural metastases are usually discovered following development of a persistent dry cough, or of signs of pleural effusion. A roentgenogram will usually establish the diagnosis. Pleural fluid should be drained before radiation therapy is administered. The lungs are then treated by direct cross-firing. Temporary benefit usually results in most cases, and in some there may be marked regression of the process.

Metastases to the liver are rarely, if ever, subjected to radiation therapy. They show little, if any, response, and the systematic reaction is so severe that it prohibits this form of treatment.

The clinical diagnosis of involvement of the brain by metastases is based on the development of symptoms of increased intracranial pressure or neurologic signs of localized brain involvement. In a high percentage of cases with brain involvement, this occurs in the terminal stages of the disease. Nevertheless, X-ray therapy may successfully control troublesome symptoms such as headache, vomiting, Jacksonian convulsions, diplopia, and paralysis of cranial nerves. It may thus add greatly to the comfort of the patient and reduce the administration of narcotics. As a palliative measure it may therefore be of great value.

Metastases to bone constitute a most interesting field for radiation therapy. Pain is usually the first symptom of bone involvement, and this is localized at the site of the metastases, but may follow the distribution of adjacent nerves. Occasionally, bony tenderness on direct pressure or percussion may be the earliest finding. When such metastases produce symptoms, they are almost always demonstrable roentgenographically. Rarely is a lesion demonstrated which does not produce symptoms. In a few cases pain may precede the roentgenologic evidence of metastases by several months.

There is considerable variation in the response of bone metastases to radiation therapy. Of the destructive types of metastases, that of hypernephroma is one of the most resistant to irradiation, as is also that of carcinoma of the bladder. The sclerosing or osteoblastic types of metastases of carcinoma of the prostate show practically no structural response to irradiation, with often, however, relief of pain and aching. Metastases from carcinoma of the cervix, and of the mouth, tongue and lip, may also show rather indifferent response to treatment. Metastases from carcinoma of the breast yield most favorably to irradiation. Relief of pain results within a few days after the first treatment, and most cases show progressive improvement. There is cessation of the destruction, and usually repair by firm new bone formation with complete restoration of function. In a number of cases sclerosis follows X-ray therapy, so that the end result resembles the osteoblastic type. Where the metastasis is osteoblastic in character before therapy, irradiation produces increased sclerosis. The clinical improvement is at times most striking. These patients are often restored to a normal life for a period of many months or even several years. Within a few weeks' time they may be transformed from almost complete invalidism to a condition where they can temporarily resume their usual activities.

It is in these responsive cases where radiation therapy receives some of its greatest encouragement. The radiotherapist must, of necessity, be an optimist. He must be able to see a ray of hope even in the most severe cases, and consider it well worth the effort to produce relief of symptoms and add a few months of relative comfort to a patient's life, even when at times he knows that the outcome is not in doubt. This is one of his most important services to the cancer patient.

Dr. A. A. Zierold: While the time at our disposal this evening does not permit of extended discussion of the various types of malignant diseases, nevertheless, Dr. G. T. Nordin has prepared a brief account of his experience at the Swedish Hospital in the treatment of uterine and prostatic malignancy. As I previously mentioned, Dr. Nordin is the Roentgenologist at Swedish Hospital and has at his disposal apparatus developing 200,000 volts. I take great pleasure in presenting to you this evening, Dr. G. T. Nordin.

Radiation Therapy in Uterine and Prostatic Malignancy

Dr. G. T. Nordin: Radiation therapy is only one of the methods at hand for the treatment of malignancy of the cervix uteri. I do feel, however, that it is one of the most important methods, particularly as far as the cervix is concerned.

As early as 1924, Dr. A. W. Crane of Kalamazoo, Michigan, made the prediction that within ten years the problem of cancer of the cervix would be turned over to the radiologist. As you all know, his prediction came true long before the ten years were up. The treatment of malignancy by X-ray is usually spoken of as "deep X-ray therapy." This, I think, is a misnomer, and should be designated as "high voltage therapy," meaning a voltage of not less than 200,000 volts. It is not only necessary that we have the required equipment to work with but it is also necessary that we know where and how to use it, and that we see to it that the patient, as well as the radiological technician, is protected from stray radiation.

The same degree of skill is necessary on the part of the radiologist as that required of a successful surgeon. Errors in judgment on the part of the radiologist may produce serious results the same as in surgery. It is not only necessary that we know how much X-ray radiation to give the lesion but we should also look after the general welfare of the patient. By this I mean that the treatment room must be well ventilated, so as to reduce the amount of liberated ozone in the room to a minimum, otherwise the patient is going to complain of the so-called "radiation sickness." I have found that if the patients are given plenty of water and fruit juices they feel much better. If a mild sedative is given previous to each treatment, this also aids considerably in avoiding "radiation sickness."

When I first began to treat malignancy with high voltage X-rays, I gave the entire erythema dose in one treatment, and the patients became very ill. Later, I gave them only one-third of an erythema dose for four days, repeating a similar series from the opposite side. In this way the patients do not become ill during the treatment, and it is my opinion that this way of treating them is more effective than the former.

The type of filter used is of importance. If too thin a filter is used, much of the effective radiation is lost. This increases the time, the discomfort of the patient, and the wear and tear of equipment. Lately I have used the composite filter, containing sheets of tin, copper, and aluminum. This type of filter absorbs all of the soft radiation, and leaves most of the effective radiation intact. The usual distance of the X-ray tube from the skin of the patient is about 50 centimeters, unless for some reason this is impracticable. The percentage increase in deep radiation where a greater focal-skin distance is used, is so slight that it is almost negligible and the time is very much longer.

It is almost impossible to consider radiation therapy of malignancy of the uterus without including radium. I have a chart showing diagrammatically the distribution of the two energies in the pelvis of the treated individual. You will notice that the two energies compliment one another very well. One obtains the maximum amount of radiation at the site of the tumor without endangering the surrounding structures, as the bladder and the rectum, and yet enough radiation to the adnexal region to be effective. The amount of radium to be used depends upon the size of the patient and the size of the tumor. The larger the patient and the larger the size of the mass of the tumor, the larger the dose. This may vary from 1,000 to 4,000 milligram hours of heavily filtered radium. I am not going into the details of the applications of this energy, as this, I understand, will be covered in another paper.

It is very important that the maximum amount of radiation be given the first time the patient is treated, because the malignant cells, at this time, are usually more sensitive to radiation than they will be later on. It is, therefore, very evident that the success of the radiation treatment depends to a great extent upon the first radiation dose. We must naturally guard ourselves against giving too much so as to do irreparable damage to the surrounding structures. It is almost as bad to give too little, because the growth of the cells would be attenuated for only a short time, and they would grow even faster later on.

When one examines the patient two months after a complete radiation of this kind, one is often very much surprised at the complete disappearance of the tumor mass and the normal appearance and feel of the structures. Although it seems that all of the malignancy has been disposed of, if these tissues were carefully examined microscopically, one would find nests of cancer cells surrounded by connective tissue. If the surgeon would step in at this time to clean out what was left from the radiation treatment and prevent the reactivation of these cells and the further spread of same, we would be doing more for our patients. The closest cooperation between the surgeon and the radiologist is bound to produce the best results, and until then we are going to get nowhere with the cancer problem.

The problem, so far as cancer of the prostate is concerned, is considerably easier, because of the fact that the gland lies much closer to the surface, both to the anterior and to the perineal surface. In these cases I give one erythema dose from the front, the back, and the perineum. In this way I can deliver about 115% of an erythema dose to the prostatic region. It has been very gratifying to note the relief that the patients receive from the X-ray treatment. Most of these patients come in because of pain and retention, and, many times, before the patient finishes the series the pain has been relieved and the retntion has ben markedly lessened. To be sure, many of the patients complain of almost complete obstruction during the course of the treatment and have to be catheterized. This, however, does not last very long because shortly the size of the gland begins to diminish and the patient is able to pass his urine. Occasionally one finds a very radio-sensitive carcinoma of the prostate that literally melts away. I am sorry to say that this is the exception rather than the rule.

The cases that I have taken care of during the past ten or twelve years have been operated upon after the first or second series of X-ray treatment; the operation consisting of the removal of sufficient amount of tissue along the course of the urethra to completely relieve any tendency toward obstruction. During the last year or two this surgery has been done by means of the endotherm-knife or the endotherm-loop. During the

past year we have tried to insert radium by catheter into the prostatic portion of the urethra following a course of high voltage therapy. As far as we can tell at the present time, this, apparently, is going to work out well. Sufficient time has not elapsed to express a definite opinion. The value of high voltage therapy in metastasis from the prostate is well known; however, this will be covered in another paper.

Dr. A. A. Zierold: In every community there are some few individuals who require no introduction. There is little that I can tell you concerning the next speaker which you do not already know. Dr. Allison has, for a number of years, concerned himself not only with the broad field of Roentgenology but with the more specialized field of deep therapy. I am sure that from the breadth of his experience his remarks this evening should prove interesting and valuable. I take great pleasure in introducing Dr. R. G. Allison who will speak to you concerning "Radiation Treatment in Carcinoma of the Breast."

Radiation Treatment in Carcinoma of the Breast

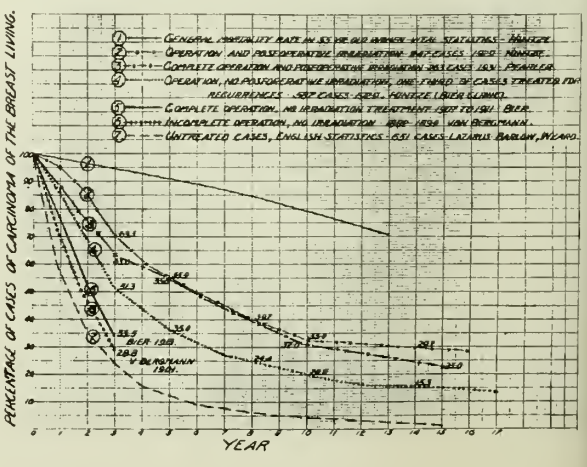
Dr. R. G. Allison: The radiation treatment which is being employed at present in this locality in carcinoma of the breast consists primarily of postoperative radiation. Our routine at present is as follows:

The patient is referred to us by the surgeon shortly after the breast amputation has been done. If possible, we start our treatments about ten days after the amputation has occurred. Radiation given at this time has no deterrant effect on the healing of the wound. Our treatment consists of X-ray applied over three fields and is usually completed within four or five days. The factors which we use are: 200 K. V.—30 Ma. at 50 cms. distance and with ¾ MM. copper and 3 MM. aluminum filter. An erythyma dose can be given over each area at this setting in 15 minutes.

As I have said, the greater part of our therapy is postoperative therapy. The fact that this is administered postoperatively is not by our choice. We rarely see a patient with carcinoma of the breast before operation. This is, I think, due mainly to the attitude of the surgeons who feel that any time elapsing between diagnosis and the resultant surgery in cases of carcinoma of the breast is time wasted or worse. They have this feeling because they believe that delay will simply be time in which metastasis may occur. This feeling is perfectly natural and is based on a lack of knowledge of what can be accomplished by radiation. Frequently, also, I believe we see patients after operation who are sent to us because the surgeon feels that radiation will do no harm and may possibly do some good. In other words, postoperative radiation is often given merely to assure the patient that everything is being done.

There is no dispute that radiation has a known and proven value in carcinoma in locations other than the breast, notably the cervix of the uterus. There are still those who maintain that radiation is of no proven value in carcinoma of the breast. However, we have all seen these same individuals refer inoperable or recurrent cases of carcinoma of the breast for radiation and invariably they admit that such cases are benefited by the radiation.

Dr. Bloodgood, in a recent publication, tells of his experience with a patient suffering from carcinoma of the breast. The patient was suffering from an apparently inoperable carcinoma of the right breast with advanced involvement of the breast but without palpable axillary glands. There were no demonstrable metastases. The patient, 65 years of age, was feeble, and a poor operative risk. Radiation was administered and nothing else was done for a period of three months thereafter. The general condition of the patient was not affected by the radiation. At the end of the three months Dr. Bloodgood performed, with the electricautery, a chest-wall excision of the breast, the lower portion of the pectoralis major and a large area of skin. The periphery of the tissues removed showed no evidence of carcinoma grossly and since no glands were palpable in the axilla a radical operation was not performed. More than a year has elapsed since the operation and the patient is still living with no evidence of carcinoma and is as well as she was preceding the X-ray and surgical procedures. The tissues removed at the operation, when studied microscopically, were very illuminating. In that portion of the tumor which had received the greatest amount of radiation a new type of connective tissue was discovered. This connective tissue differed from normal breast structure and also showed no evidence of carcinoma. In the area surrounding this zone numerous cancer cells were found. These cancer cells were only distinguishable by their outlines, as the cellular structure took no stain. In the tissue which had received the smallest amount of radiation nests of cancer cells were discovered. These cancer cells differed in no particular from those in cancer of the breast that had not been exposed to radiation. This case demonstrates very definitely the value of radiation. To my knowledge this case is the only one in which tissues have been obtained at such a length of time following radiation. In the average case which is treated preoperatively a radical resection is done about ten days following the treatment. This length of time is insufficient to allow for structural changes to occur in the tumor and the morphological and cultural char-



acteristics of the cancer cells have not been sufficiently changed to allow conclusions to be drawn.

Carcinoma of the breast, no matter what type of treatment it receives, presents a gloom picture. Statistics on this subject vary widely, but large number of series of such cases show that when treated by surgery alone about 70% of all patients coming to operation die within five years. The majority of the remaining 30% die ultimately from cancer.

Dr. Portman of the Cleveland Clinic has recently presented a series of cases, consisting of 103 consecutive cases in which surgery and radiation were combined in treatment. He divided his cases into three major groups as follows:

Group I—Consists of those cases in which the tumor was limited strictly to the breast and the patients were free from involvement of the axilla as reported by the pathologist.

Group II—There were axillary involvements, slight skin involvement, but the tumors were still movable.

Group III—The cases were more advanced but still were considered by the surgeon to be operable.

In his series in Group I, 77.6% of the patients were free from cancer at the end of five years. In Group II, 61% lived for five or more years and 56.3% were free from cancer at the end of five years. However, of those in Group III, 84.4% died of cancer and only 18.7% lived for five years. When all cases are considered as one group, he found that 50.5% lived five years or more and that 42.7% were free from disease for five years or more.

Cases of carcinoma of the breast treated by radiation alone are as yet not numerous. However, numerous cases are on record of inoperable carcinoma of the breast which has been treated by radiation alone with good results. To date, little of value has been published regarding such cases. This is true because practically all such cases have been treated and observed without biopsy. Without biopsy such a case is of no value for statistical purposes. Individual experience has shown, however, that treatment of carcinoma of the breast by radiation alone is of distinct value.

A recent bulletin from the New York State Institute for the Study of Malignant Diseases states, "Radiation and conservative operation were also practiced * * * with some astonishing results * * * and with marked improvement in the lesions. Noteworthy was the effect in two women who were pregnant and had large malignant tumors in their breasts which completely disappeared by this method of treatment."

Dr. Douglas Quick of New York has followed an operable carcinoma of the breast treated by radiation only for well over 14 years. In this patient the tumor was 2½x3½ Cms. in diameter and there was a questionable node in the axilla. The tumor regressed rapidly at first and then more slowly. After three years there was a dense residual mass in the breast and telangiectasis of the overlying skin. The condition has not changed since that time.

The majority of authorities feel that biopsy can safely follow intensive radiation after an interval of two weeks. With this knowledge available it should only be a short time until statistics on the value of treatment by radiation alone will have reached a stage at which conclusion may be drawn as to the relative merits of the various types of treatment.

With the realization that treatment of carcinoma of the breast is as yet far from satisfactory it seems that every effort should be extended towards improving the results obtainable. Knowing the value of radiation in carcinoma in general it seems only logical that preoperative as well as postoperative radiation should be a routine in the treatment of carcinoma of the breast. Such treatment slows growth in the primary tumor and brings about a regressive and degenerative effect on the tumor bed as well as on the tumor cell. A certain number of deaths following surgery are due to dissemination of the tumor cells at the time of the operation. Postoperative radiation does not get at these cells because they are outside the field of radiation. Preoperative radiation will reduce this type of dissemination. Operation should be deferred until six or eight weeks after the preoperative radiation is completed. Preoperative radiation must be by means of X-ray. The application of radium is impractical and the implantation of radium is contra-indicated. It must be remembered that inoperable carcinoma of the breast cannot be rendered operable by radiation. The more spectacular the regression the more malignant the tumors and, hence, the more dangerous is surgery.

Dr. J. Frank Corbett: Radium is recognized as a very used adjunct in the treatment of cancer and we have long felt the need of a survey of the available radium in Minneapolis for the treatment of private patients. Radium is used in the form of emanations and also in the small tubes of the actual radium salt which are designed for the local application. We do not have a radium emanation plant in Minneapolis where emanations are available for the treatment of private patients although we do have a very nearly ideal emanation plant at the University of Minnesota Cancer Institute for the treatment of such paients as may enter the cancer institute. The facilities of this institute, however, are not available to the surgeons not connected therewith. Dr. Martin Nordland has been appointed Chairman of the Sub-committee to survey the available radium in private hands in Minneapolis and this survey has revealed a surprisingly large amount of radium in this community. Dr. Martin Nordland—

Report on the Use of Radium as an Adjunct to Surgery with Survey of Facilities for Radium Therapy in Minneapolis

Dr. Martin Nordland: The medical profession has begun to realize that radium has its place in the armamentorium of the surgeon, that surgery is a useful adjunct to radium therapy, and that, although treatment by radium alone has a definite place, much can be done by a combination of methods which cannot be accomplished by either alone.

Most of the malignant diseases for which radium is used have hitherto been treated by surgical means and it is of the greatest importance that the medical pro-

fession should realize where radium *can help*, where *supercede* and where *hinder* the surgeon. It is inevitable that in many instances radium therapy and surgery should overlap.

It is only within the past six years that the *knowledge of the physics* of radium has been brought to bear on the therapeutic measures. Because of this knowledge radium therapy has been put on a more rational basis, but much has yet to be accomplished before any rules can be laid down.

The knowledge of the reaction of certain kinds of tumors to roentgen rays and radium has led Dr. Desjardins to suggest a method for the identification and classification of tumors which, while not so broad as pathologic methods, may be useful. He cautions that in spite of the excessive faith of many physicians in competent pathologists, one cannot rely too blindly on their verdicts, particularly when conflicting with physical, clinical and roentgenologic data.

The method suggested is based on the fact that each variety of cell in the body has a specific range of sensitiveness to roentgen rays and radium. Although the cause for such specificity has not yet been determined, the sensitiveness peculiar to each kind of cell appears to be related chiefly to the natural life cycle of the cell. It has been noted, for example, that the lymphocyte which has the shortest life cycle, is also the most radio-sensitive, while the nerve cell, which has the longest life cycle, is also the most radio-resistant. Cells have been classified by Desjardins according to their radio-sensitiveness in the following order:

1. Lymphoid cells (lymphocytes).
2. Polymorphonuclear and eosinophilic leukocytes.
3. Epithelial cells:
   (a) Basal epithelium of certain secretory glands, especially of the salivary glands.
   (b) Basal epithelium (spermatogonial cells) of the testis and follicular epithelium of the ovary.
   (c) Basal epithelium of the skin, mucous membranes and certain organs, such as the stomach and small intestines.
   (d) Alveolar epithelium of the lungs and epithelium of the bile ducts (liver).
   (e) Epithelium of tubules of the kidneys.
4. Endothelial cells of blood vessels, pleura and peritoneum.
5. Connective tissue cells.
6. Muscle cells.
7. Bone cells.
8. Nerve cells.

The radio-sensitivity of the epithelium of the skin is found about half way between the lymphocyte on the one hand and the nerve cell on the other. The difference in susceptibility is sufficient to enable one to distinguish readily between the two.

Therefore, general rules can be laid down as to the effect of radiation on tissues which are sensitive to its action, since it is certain that tissues *vary in their sensitivity to radium*. The probable effect of radiation can be foretold if certain factors in the structure of the tumor are known as from biopsy.

Generally speaking, tumors in which the cells have great reproductive power (embryonic) are radio-sensitive while tumors in which the cells are highly differentiated are radio-resistant. A *clear distinction* must be drawn between a marked *radio-sensitivity* and *curability*. The non-differentiated radio-sensitive type spreads rapidly and gives rise to early metastasis and a grave prognosis. It is easy to cause clinical disappearance but recurrence is common.

An important factor in reducing radio-sensitivity is *infection*. The reason for this is not known but radiation increases inflammation and the effect of treatment on an infected growth is often to induce a flare-up without effect on the tumor itself. In cases of carcinoma of the cervix, much is gained by preliminary local treatment. *Metastases* are also always more resistant to treatment than the primary lesion.

The *latent period*, that is the period between irradiation and changes in the tumor, varies by wide limits, hours to weeks. Whereas lymphoid cells are rapidly influenced by moderate irradiation and undergo more or less marked inhibition of mitosis and degenerative changes within from half an hour to three or four days, corresponding changes in epithelial cells are caused only by a much longer dose of rays and do not become apparent for a week or even longer. In this connection may be mentioned *delayed radium burns*. These are common in radio-resistant tumors. The burn appears as an ulcer surrounded by hard indurated edematous tissue and covered by an adherent offensive yellow gray slough. This should not be confused with the carcinoma.

The history of radium as a therapeutic agent is so short that it is not possible to describe the more recent advances that have been made without correlating them with the early story of radium. The story of radium begins with the discovery of radio-activity by Henry Becquerel in 1896, followed in 1898 by the discovery of radium by Monsieur and Madame Curie who analyzed Becquerel's pitch blend further. They found that it contained some radio-active minerals three or four times more radio-active than could be accounted for by the uranium content. They concluded that the ore must contain some other substance. In 1898 they published the results of their investigation and claimed the discovery of a new element which they called radium. The announcement came on Christmas day and obtained for them a half share in the Nobel prize for that year.

The amounts of radium produced by early workers were infinitely small. Three (3) grams annually came from Joachmisthal Bohemia, which country set up the first radium monopoly. This amount was mainly used for experimental purposes and the price changed from $10,000 per gram in 1904 to $150,000 in 1910. The United States then began to produce the only radium available in the world from Carnotite mined in Utah and Colorado. A Pittsburg capitalist, Joseph Flannery, whose sister had died of cancer, organized the Standard Chemical Company in 1912 and from that time until 1922 produced four-fifths of the world supply of radium. In 1913 ores rich in uranium were discovered in the Belgian Congo, but it was not until 1921 that

the full advantage of this discovery was realized and then not until three years later (1924), Belgium set out to break the radium market. By 1926 Belgium had complete control. From that time the price of radium began to fall, dropping from $170,000 to $50,000 per gram. Of the world's 700 grams or more, some 400 grams have been sold by the Belgians.

There has recently been discovered in Alberta, Canada, in the region of Great Bear Lake, an ore exceedingly rich in Uranium. Great Bear Lake mines may kill the monopoly and shoot down the price of radium. The price may fall, but the probable solution is that Canada and Belgium will compromise on a price profitable to both and radium will remain a luxury for those who can afford to die expensively.

How Much and Where Is Radium?

The world, so far, has produced only about 700 grams—one and three-fourths pounds. It is so valuable that four-fifths of this can be located somewhere. It is located as follows:

United States—	
287 hospitals	90 grams
414 physicians	35 grams
9 laboratories	6 grams
Estimated private and industrial	107 grams
Total in United States	238 grams
Belgium	160 grams
Czechoslovakia	55 grams
France	51 grams
England	42 grams
Sweden	8 grams
Denmark	4 grams
Argentine	2 grams
Unaccounted	140 grams
In all	700 grams

The state of Minnesota has 4,512.3 mgm. of radium.

The city of Minneapolis (private hospitals and physicians), 945 mgm. of radium.

Authorities in France and Sweden state that two (2) grams of radium should be available for each million population or for each 1,000 deaths from cancer. Therefore, an additional gram is necessary for the state quota. Minneapolis, with its 945 mgm., or one gram available for its private hospitals and private physicians, has sufficient quantity for its 500,000 people.

In common with most new and startling discoveries, radium therapy has suffered from over enthusiasm among its advocates and from hasty criticism by its opponents. This is especially true in its relation to cancer, where radium has been hailed by the lay press as a cure-all and the public encouraged to believe that it would do all things. While irradiation is a "treatment" that has a definite effect upon cancer, to date its effect is slight since 83% of all cases end in death from cancer. Radium in incompetent hands is a dangerous agent and may be as perilous as cancer itself.

We have with us tonight a group of men who have had considerable experience in the practical application of radium. Dr. Charles R. Drake, Director of the Laboratory at the Swedish Hospital for a great many years, is known to most of you and because of his wide experience in the use of radium I would like to have him speak to you with reference to radium in uterine malignancy. I am pleased to introduce Dr. Drake to you.

Uterine Malignancy

Dr. Charles R. Drake: Uterine malignancy is the most frequent primary malignancy occurring in women, being from 25 to 30% of all such malignancies. These malignancies consist of carcinoma and sarcoma. Sarcoma is of such rare occurrence that it will not be considered in this discussion, although the treatment of sarcoma is essentially the same as that of carcinoma. Uterine malignancies occur most frequently in the fourth, fifth or sixth decades of life, but occasionally they occur between the ages of 20 and 30 and in the aged.

Uterine carcinomas may be classified in several ways:

First, the Pathologic type.

Second, the Degree of malignancy.

Third, the Anatomic situation: (a) location, (b) extent of growth.

First, the pathologic types are (1) the adeno-carcinoma and (2) the epidermoid carcinomas. About 10% of all uterine carcinomas are adeno-carcinoma and most of these occur in the fundus of the uterus. Less than 5% of the carcinomas of the cervix are of the adeno-carcinomatous type. The epidermoid or squamous cell type of carcinoma rarely occur in the fundus. In the cervix they vary in cell morphology to such an extent that it is rather difficult to adequately describe them. Suffice it to say that all types of epidermoid varieties of cells may be found. The irregularity of growth is protean but all are malignant.

Second, the degree of malignancy. There is a proposal to classify the carcinomas by grades (Broders' classification) that is—grades one, two, three and four, grade one being the least malignant, grades two and three of moderate malignancy, and four, of the highest degree of malignancy. This is based upon the inherent appearance of the malignant cells. However, in the treatment of malignancy, all grades must be considered potentially vicious and should be treated all alike.

Third, the anatomic. This is the classification as formulated by the Cancer Commission of the League of Nations as reported by the Radiological Sub-commission of that body. It is substantially as follows:

Stage 1—The growth is limited to the uterine cervix. The uterus is freely movable.

Stage 2—The lesion spreads into one or more of the fornices with or without infiltration of the parametrium adjacent to the uterus, the uterus retaining some degree of mobility.

Stage 3—(a) Nodular infiltration of the parametrium on one or both sides, extending to the wall of the pelvis with limited mobility of the uterus or to full fixation of the same. (b) Superficial infiltration of the vagina with mobile uterus. (c) Metastatic growths in the pelvic nodes with relatively small primary growth. (d) Isolated metastatic growth in the lower part of the vagina.

Stage 4—(a) Massive infiltration of the parametrium on all sides. (b) Carcinoma involves the bladder or the

rectum. (c) The vagina is infiltrated. (d) Remote metastatic growths are present.

The above major classifications are of considerable value in the selection of the method of choice in treating uterine malignancies. The agencies at hand for such treatment consist of surgery, electric cautery, radium and high voltage X-ray. Primarily, the subject belongs to the field of surgery. In the consideration of the method of choice there must be the proper clinical consultation by the surgeon, the pathologist, the radium therapist, and the roentgenologist. Each case of uterine malignancy is an individual problem and should be treated as such regardless of the above classification and no hard and fast rules can be applied. The principle upon which successful cancer therapy is based is the complete eradication of the disease. Presence or absence of metastases plays an important part in this and may occur early or late. Metastases are not always demonstrable and therefore, all treatment should be directed in such cases as though there were none and if they manifest themselves later, be treated accordingly.

Lord Moynihan recently summed up the value of radium and, of course, deep X-ray, in the following manner: "The surgeon's knife in the most highly trained hands is an instrument of great delicacy, but it cannot always discriminate between healthy tissues and diseased tissues. Radium is an instrument of far greater delicacy because its action is selective, that is to say, it acts differently upon the diseased and healthy tissues, killing the one and leaving the other. The difficulty of its application sometimes lies in obtaining access to the diseased parts when they are inside the body and in placing it in close relation to every particle of cancerous tissue where access has been obtained. Great advances have been made, and it is now true to say that certain mutilating operations have been virtually abolished as, for instance, those concerned with the treatment of cancer in the mouth or on the tongue.

"Radium will gradually encroach more and more upon the field of surgery, but it can never entirely replace surgery since it is not everywhere applicable. Where radium is applicable, its effect will always depend upon greater diagnosis of the disease so that greater success can only follow upon greater readiness of patients to present themselves for examination and upon the increasing skill of the medical profession in diagnosing the disease. It is a fair claim to make that the results up to the present are encouraging, but in the treatment of cancer we must always take the long view, and must seek to know what results are found, not in a few months' time, but at the end of not less than five years."

Adeno-carcinoma, which is probably the least malignant and which is usually confined to the fundus of the uterus, is best treated surgically by complete hysterectomy, followed by a radium pack in the vagina and by deep X-ray therapy if considered advisable. In those patients who are poor surgical risks or those who refuse operation, the insertion of radium tubes, containing in the aggregate 100 milligrams in tandem so as to cover the entire uterine mucosa for a period of 30 to 36 hours is advisable. This can be repeated in eight or ten weeks by a dose of equal amount for 24 hours.

Epidermoid carcinoma of the cervix is probably best treated by radiation. Some workers have advocated post-radiation hysterectomy to be done in early and selected cases. Other workers have classified carcinoma of the cervix as operable, border-line, and inoperable, but have advocated radium in all. Moynihan's dictum should be followed in carcinoma of the cervix because of the difficulty of complete eradication by surgery and because of the penetration and selectivity of radium.

The radium treatment of carcinoma of the cervix has been done generally in two ways. First, smaller amount of radium over a longer period of time or, second, a large amount of radium for a shorter period of time. This latter method consists of one heavy treatment at one sitting followed two or three months later by a second prophylactic treatment of lesser amount. The latter method is the method which I prefer as it requires less inconvenience and less expense to the patient. One should hit hard while the hitting is good.

The application of radium should consist of from 100 to 150 milligrams to be used for 30 to 36 hours, giving a total of 3,000 to 4,500 milligram hours (mgh.). The radium should be in 25 and 50 milligram tubes, screened with bronze and rubber. If possible, one tube should be inserted into the cervix beyond the inner os, another tube should be placed directly in the cervix, and the other tubes should be placed horizontally across the cervix in front. This gives good cross-firing through the entire area involved. The radium tubes should be held in place by gauze packs and occasionally sutures may be used. The packs should be placed plentifully against the bladder and the rectum. Laterally there is not so much need of screening. The gauze makes the best screen by reason of distance obtained to prevent the burning of the tissues. Each case is a separate problem and the arrangement of the tubes and gauze will be made accordingly. The main thing is the close approximation of the radium to the malignant areas. It is at this point that the pathologic classification comes in and is of value in determining the success of the treatment. Some workers have used radium needles or implants of emanations but the tissues are hard to get at with needles. It is hard to properly place the needles and the tissues act too greatly as a screen for deep penetration. Furthermore, the cautery effect is too great. The most effective radiation is the gamma ray radiation and this is obtained from the radium in tubes.

All carcinomas of the uterus are not cured. Many of them are cured. The percentage of cures varies with the methods employed and also with the stage of the case at the time of the treatment. All cases should be thoroughly treated largely in the same manner, as some of the worst in appearance, both clinically and microscopically, are the most amenable to treatment and cure. Likewise, those cases in stage four show much amelioration with the clearing up of foul discharges and the prolongation of life.

Associated with the use of radium in the treatment of uterine malignancy is the use of deep X-ray therapy.

This has been discussed in a previous paper. I wish to emphasize the value as an additional means of cross-fire radiation. It should be used in most cases of uterine malignancy as an additional weapon to obtain a cure.

The measure of success of any method depends upon the end results. The results of radiation therapy should be determined by the record of cures and the prolongation of life, the analysis of such records and statistics depending upon the type and the stage at which the treatment was started. Present statistics are accumulating rapidly which are showing the marked value of radiation therapy in uterine malignancy. The best results are obtained where careful consultations are held by the surgeon, the pathologist, and the radiologist.

Dr. Martin Nordland: The benefits of radium have been frequently discussed but many of us have never thought about the dangers in the use of radium. Dr. A. S. Fleming from the Hillcrest Hospital is well qualified to discuss this subject. We will now hear from Dr. Fleming.

Dangers in the Use of Radium

Dr. A. S. Fleming: Of the several methods used in the treatment of cancer today, surgery, X-rays and radium, I think it may be safely said that radium is as free from danger as any. There is little, if any, immediate mortality. There is less shock or intoxication and the success following its use in certain types of cancer leads one to hope that its field of usefulness may be extended as our knowledge and skill in its application increases.

Used as a palliative measure in the recognized hopeless and inoperable cases, it brought about such surprising and gratifying results that today no case of cancer should be denied the opportunity of receiving treatment by this potent agent that has the slightest chance of survival in the light of our newer knowledge.

On no subject in connection with the treatment of cancer is there more misinformation abroad than with reference to radium. One error very generally met with concerns the effect or danger of light or insufficient treatment in bringing about stimulation of the growth and hastening its metastasis. This idea is not only entertained by the layman but also very generally by the medical man. This notion is on a par with the fear of the surgeon's knife and the taking of sections for biopsy. The effects of gamma radiation on the malignant cell is always one of inhibition, either temporary or complete destruction. It never stimulates.

The criticism that should lie against light or insufficient radiation is not that it stimulates the growth of malignant cells but that the one opportunity that the patient may have of cure may be lost by the temporary relief that may follow. There never will recur as good an opportunity for successful treatment of the growth as when it is first discovered. The first course of treatment should be to the limit of normal tissue tolerance. If that is done, says Dr. G. E. Pfahler of Philadelphia, many more of our patients will recover than if we try to give as little radium as possible.

On a par with the above misconception is the prevailing opinion that the application of radium is an extremely simple process and that anybody can do it. This is the cause, according to the observations of Dr. Ward of the Women's Hospital in New York, of a great deal of unnecessary suffering in the forms of various complications. He says that Dr. Regaud of Paris has stated very aptly "that it is necessary to have much experience to obtain from this method of treatment all of the good that it may give without the evil it may do."

Radium is a very potent substance. Anyone aspiring to give radium treatments should know as much as possible of its physics and chemistry, and of its biological effects, its limitations and its suitability to the particular case in hand. Every case of cancer is an individual problem and no one treating cancer should be so wedded to one line of treatment that it is applied indiscriminately. The use of surgery, radium and X-ray, one or all combined, may be needed to secure the best results.

There is one danger that I think should be called to your attention, and that is the advertisement of the commercial radium concerns telling how to cure cancer with the aid of their radium which they will supply with the advice of their expert in radium dosage and technic. This practice and insidious appeal, I think, should not meet with your approval. The treatment of cancer cases by remote control is not the best treatment.

Dr. Martin Nordland: It is a question whether the discussion of malignancy of the skin should be included under the division of radium therapy. We will let the next speaker decide this question for you. I take great pleasure in introducing Dr. S. E. Sweitzer.

Skin Malignancy

Dr. S. E. Sweitzer: In the first place, I want to emphasize that you must make a diagnosis of the condition before you can treat it with anything. We cannot expect everyone to be a dermatologist, but we hope that if he does not know what the lesion is he will ask someone to help him out. That is only natural, you see. We find that quite frequently skin cancers are allowed to exist for months and sometimes years. They are slow-growing and physicians who should really know better will tell their patients that they should leave these lesions alone. Any lesion on the skin, particularly the face, which begins with a small ulcer, should be looked on with suspicion and an effort made to determine the diagnosis.

In the treatment with various physical methods, X-ray and radium, I want to emphasize that the idea of the treatment is to destroy these cancer cells and that is being done by giving a heavy dose. We have gradually increased our base limit of dosage higher and higher as we have had more experience because we have found that more and more of these cases, instead of being basal, were mixed and sometimes were squamous. It is not so easy to tell them apart.

I will show you a few slides.

Slide: This is a basal cancer, the type of lesion that is sometimes present for months and sometimes years before the patient presents himself to the physician. It

does not metastasize and is curable either with X-ray or radium.

Slide: Here is another basal. In making biopsies of these cases we find that we are able to make a diagnosis but we cannot make them as well as we formerly thought we could, so we are increasing our dosage to be sure we are not missing anything. This is one at the corner of the eye and can be easily treated with X-ray.

Slide: This is a very common site, the side of the nose. They can be treated with either X-ray or radium. There is no reason why you cannot excise a malignancy of the skin as well as any other malignancy but on the face you haven't the space to spare and on the nose, particularly, it is difficult to remove all the lesion and it is likely to reoccur.

Slide: This lesion is near the eye and is quite large. Frequently, if the lesions are as thick as this one is, I use a little cautery and flatten them before I use radium or X-ray in order to be sure the thickness will not act as a filter.

Slide: This is a lesion on the end of the nose. These lesions on the nose are quite difficult to cure. They may involve the sebaceous glands. It is necessary, in treating with X-ray or radium, to give them a very heavy dose.

Slide: This type of lesion, on the upper eyelid, is very difficult to excise. You have a troublesome task with an eyelid and we have found the best way is to have a metal plate that fits over the eyeball and then use X-ray treatment.

Slide: This is one of the types we really think we can call an actual basal. It is very extensive and very superficial. The danger of this type is that it may get into the canal of the ear and kill the patient in spite of the fact that it is a very low-grade malignancy. It was cured with X-ray, seven skin units.

Slide: Here is a lesion on the ear. We find that the malignancies on the ear usually involve the cartilage and are very difficult to treat. The cartilage does not seem to respond to either radium or X-ray therapy. We try our best to treat them with radiation therapy and if they do not respond we must excise the part of the ear that is involved.

Slide: This is a squamous involving the bone. We did a very thorough excision with cautery and gave very heavy treatments of X-ray but the lesion relapsed and was not cured.

Slide: This is a malignancy of the upper lip. These can be treated in various ways if they are found early enough. Usually we treat them with heavy X-ray.

Slide: This is very superficial cancer of the lower lip with no glandular involvement and can be treated by X-ray or radium very nicely.

Slide: These malignancies of the hand are squamous and usually require amputation, either total or partial.

Slide: In this case a part of the hand was amputated, trying to do some conservative surgery. These are very malignant and metastasize early.

Slide: This patient had a malignancy of the tongue. He had radium needles put in and I do not know whether or not he is cured. It is rather difficult to follow some of these patients to know whether or not they are cured as many of them are "floaters" and do not have permanent addresses.

Slide: This is a case of Paget's disease. It is included with the skin diseases but it really comes from the glands. The few cases of this we get we send to the surgeons for excision of the breast.

Dr. Martin Nordland: The discussion of cancer of the oral cavity should rightly come at the beginning of this symposium. Dr. Wm. T. Peyton of the Cancer Institute of the University of Minnesota has kindly consented to discuss this subject. I feel he is particularly well qualified to speak on the scope of radium therapy with reference to this subject because of his large experience in this field.

Treatment of Cancer of the Lip

Dr. Wm. T. Peyton: The primary lesion in carcinoma of the lip can always be treated by radiation but a small well circumscribed lesion may be removed by excision; "U" shaped excision is preferable to the usual "V" shaped excision. In advanced lesions, diffuse lesions spreading over a considerable part of the lip and recurrent lesions extensively infiltrating the lip, the deformity following adequate surgical removal is prohibitive and unnecessary. Primary lesions of the lip inadequately treated with persistence or local recurrence of the lesion are best treated by wide excision.

The technique of radium application for carcinoma of the lip is illustrated in Fig. I. Approximately 100 mg. hrs. is used for each square centimeter of inner surface of lip treated. The area treated is approximately as great as the area excised in surgical removal of a cancer of the lip; it is approximately 1 cm. on all sides of the visible or palpable edge of the tumor. Kerr dental wax is used to make the mould. Lead filter ½ mm. thick is placed on the surface over the radium needles. A lead protector 1 mm. thick is embedded in the wax to protect the roof of the mouth and upper lip. The tongue is pushed back by the wax to diminish the radiation of the tongue by keeping it at a distance from the needles. Since this application is applied to the inner surface of the lip only, the outer surface of the lip is treated by a full erythema dose of X-ray (100 S. E. C. or approximately 1000r).

Immediately after this treatment of the primary lesion prophylactic high voltage X-ray therapy is given to all of the cervical lymph nodes on both sides of the neck and six weeks later the lymph nodes are removed from the submental and submaxillary triangles of each side. It is apparently important but little emphasized in the treatment of cancer of the lip that the removal of the nodes be delayed for some time after the primary lesion has been completely removed or destroyed.

The upper deep cervical nodes are removed together with the submental and submaxillary nodes if any of these two groups of nodes contain demonstrable metastatic carcinoma.

A Crile block dissection on one side is done if any of the deep cervical nodes on that side are involved with metastatic carcinoma.

Cancer of the Oral Cavity

A. Cancer of the Tongue.

The primary lesion in cancer of the tongue is best treated by radiation and this is best done by a combination of interstitial radiation and high voltage X-ray therapy.

Interstitial radiation may be in the form of platinum needles containing radium or gold implants containing radium emanation (radon); the latter are preferable because more easily inserted so as to give a proper distribution of radiation. Whichever form of radium is used it should be placed not in the lesion but under and around the periphery outside of the visible or palpable lesion approximately in the same plane that one would cut in a conservative surgical excision of the lesion. In lesions posterior to the anterior third of the tongue, part or all of the radium should be inserted through the skin of the submental region and guided into the proper position by a finger in the mouth, palpating the posterior part of the tongue and floor of the mouth in this region.

To determine the dosage take the square of the diameter measured in centimeters and this gives approximately the number of millicuries of radon that should be used.

Prophylactic high voltage X-ray therapy is given to the cervical nodes on each side of the neck. The tongue is included in the fields. A Crile block dissection of the neck is done only if and when the cervical nodes become clinically involved with metastatic cancer, never until a few weeks after complete destruction of the primary lesion.

B. Carcinoma of the Mucous Membrane of the Oral Cavity Elsewhere Than That of the Tongue.

Interstitial radiation in dosage similar to that used in carcinoma of the tongue and distributed in much the same manner is the method of choice unless bone is involved when, as a rule, surgical excision is the method of choice. This excision is carried out with surgical diathermy for the soft parts and a chisel to remove the involved bone. The external carotid artery on one side is frequently ligated to diminish bleeding during these excisions. The cervical lymph nodes are sometimes given prophylactic deep X-ray therapy but an invariable rule cannot be made for such prophylactic treatment in these lesions. Decision is made in each case according to the location and malignancy of the lesion.

C. Treatment of Tumors of the Pharynx.

Squamous cell carcinoma of the pharynx are, as a rule, treated by interstitial radiation and deep X-ray therapy but some of the well localized lesions of lower grades of malignancy may be removed by a lateral pharyngotomy. (Trotter Operation.)

Lympho-epitheliomas are treated by high voltage X-ray therapy in heavy dosage.

Dr. Martin Nordland: The last subject to be discussed with relation to the use of radium therapy is cancer of the rectum. This subject is fittingly placed on the program and Dr. Lawrence M. Larson will discuss this phase of the problem.

Radium as an Adjunct to Surgery in the Treatment of Cancer of the Rectum

Dr. Lawrence M. Larson: It is quite generally conceded that the use of radium alone is not justified in the treatment of operable cancer of the rectum but that surgical extirpation remains the method of choice in the eradication of this type of lesion. However, there have been reported a number of cases in which early lesions have been cured by radio-therapeutic methods so that unanimous agreement as to the role of radium in the treatment of small rectal neoplasms has not been reached. On the other hand, no one can deny the marked palliation to be derived in the treatment of large inoperable growths, sometimes rendering them operable, but practically always resulting in shrinkage of the lesion, definite decrease in the amount of bleeding and foul discharge, and at least temporary improvement in the general condition of the patient. Between these two extremes are cases in which there is question of operability due to extension, fixation, or size of the growth, or to poor general condition of the patient, and in these cases it is entirely possible, by adequate dosages of radium, to convert an inoperable lesion into an operable one, to render a deep lesion a surface one, and in many instances, to offer a much more favorable prognosis for cure than if surgical means alone were employed. It is thus self-evident that success depends upon the closest co-operation between the surgeon, radiologist and patient.

A large number of rectal neoplasms are amenable to radio-therapy when one considers the fact that one-half to one-third of these patients, as they present themselves, are denied surgical treatment because of contra-indications of either a local or general nature, and, further, of those operated upon not over a third remain cured for five years. This makes a total of about three-fourths of all cases in which radium can be used at some time or other either on the original lesion, on metastases or on recurrences.

There are three types of cases in which radium may be used to advantage.

1. *The Operable Lesion.* In this type of case all possible benefit should be sought from both surgical and radiological methods. This may be accomplished even in small lesions by giving adequate dosages of radium six to eight weeks preoperatively, so that shrinkage of the growth takes place. In some instances of this character, no evidence whatever of neoplastic cells can be made out after resection of the rectum, the bowel being perfectly smooth with only a scar to indicate the previous location of the lesion. In patients whose general condition contraindicates immediate surgery although the local lesion is operable, radium is of especial value. This is also true when the patient refuses operation or in conditions in which it is desired to avoid colostomy.

2. *Inoperable Lesions.* Radium may be used to advantage in many of these cases and in some it has been noted that the lesion actually becomes operable as a result of the treatment. In the others the patient's general condition is improved, and obstruction, bleed-

ing, and pain are definitely lessened. There is no question as to the palliative benefits derived in this type of case. When there is extensive infection of the perirectal tissues radio-therapy is contraindicated.

3. *Recurrences.* In a general way, the same advantages obtain in the treatment of recurrences, although to a lesser degree, frequently because of their inassessability. Local or perineal recurrences and occasionally those in regional glands, may be treated with radium alone or in conjunction with surgical means.

The question of whether colostomy should be done preliminary to radio-therapy, hinges almost entirely upon the imminence of obstruction by the lesion. In cases of definite blockage, there is no question as to the advisability of drainage of the bowel and at times it is even an urgent measure. At other times when the lesion gives evidence of impending obstruction such as produced by an annular growth located at the rectosigmoid juncture, or one involving the anal canal it is a question of judgment whether colostomy is to be done. This must be decided upon the merits of the individual case. It is true that greater accessibility to the lesion may be obtained through the distal stoma of the colostomy, as brought out by some authors, yet the procedure should seldom be done for this reason alone. When extensive infection of the perirectal tissues is present, preliminary colostomy is of aid in reducing this, so that it may be possible to use radium later.

Before beginning treatment of rectal neoplasms with radium, several factors must be ascertained. First of all, an exact diagnosis of the lesion must be made, usually by biopsy, not only as to the actual presence of malignancy but also as to the type and grade of neoplasm with which one is dealing. It is well known that the columnar cell or adenocarcinomatous type of growth is more radio-resistant than the squamous cell or epitheliomatous variety. Both of these types of growths occur in the rectum, the former originating as a rule above the anorectal juncture and the latter below. The grading of the lesion is highly desirable since tumors of high degree of malignancy (grades 3 and 4) respond most rapidly to radio-therapy and offer the poorest results from surgical therapy, while the opposite holds true for tumors of low grade (1 and 2). Most neoplasms of the rectum fall in the latter group, in contradistinction to carcinoma of the cervix of which the preponderance of cases is of high degree of malignancy. Another factor of importance is an appraisal of the general condition of the patient. If this is not satisfactory it should, if possible, be brought to the point where any complications which may arise, such as severe infection, hemorrhage, deleterious systemic effects, and so forth, may be withstood with a reasonable degree of safety.

The purpose of radium in the treatment of malignancy is to destroy or eradicate the lesion, yet maintain preservation of normal tissue. This is the same purpose attained by surgical methods, and to account for cures by this method one must assume that cancer begins as a local process, an assumption which is an entirely logical one. One must also take into consideration bodily defensive mechanisms, especially the character of the stroma making up the tumor, which may vary in its quality and quantity and thus account for different reactions of similar tumors to the same doses of radium. This difference in stroma may explain the fact that rectal neoplasms, alhough hisologically similar, are generally more radio-resistant than lesions of similar structure located in other parts of the body.

In the radio-therapy of rectal neoplasms there are several factors which operate to render treatment difficult and possibly less satisfactory than with lesions elsewhere. These are first, a difficulty in approach or accessibility to either the lesion or the regional lymphatics; second, the frequent radio-resistance of the tumor; and third, the radio-sensitiveness of the bowel mucosa. The problem is to get a maximum dosage of radium to the treatment field with the least injury to the normal tissues. Since carcinoma of the rectum, as a rule, is relatively benign except in young individuals, this margin of safety is small and accidents may easily occur. It is also true that definite rules for treatment are impossible to lay down, but that the greatest flaxibility must be observed since individual cases each present their own problem.

Two methods are generally used in attacking most cases of cancer of the rectum or rectosigmoid—surface radiation and interstitial radiation. With either method to protect normal tissues it is first of all of the greatest importance to pack away, if possible, the opposite wall of the rectum by means of gauze. Since distance is the best filter of the radium rays because the dosage of radiation has been found to be inversely proportional to the square of the distance, one can appreciate the importance of adequate packing. These needles contain usually 1 milligram of radium and are filtered by .5 millimeters of platinum. They are placed in the growth 1 centimeter apart and left for 48 hours. The average growth takes from 15 to 20 of these needles, so that 800 to 1,000 milligram hours are utilized in this manner. The position of these needles, 1 centimeter apart, is calculated to destroy the neoplastic tissue in this area but it is a well known fact that malignancy does not grow in definitely regulated paths, consequently this type of treatment must be supplemented by surface radiation, a method by which the radiation is intended to reach all parts of the tumor.

The latter is done by packing the opposite wall as far away as possible. A radium pack is applied to the lesion, the dosage being so calculated so that for every square centimeter of surface of the growth there will be 50 to 70 milligram hours of radium given. This is usually accomplished by means of applicators, each containing 50 mifligrams, which are kept in place 12 to 14 hours. A little reaction on the part of the normal tissues is to be expected but this should never be severe. In low lying lesions, especially those of the anorectal area, it is important to irradiate the inguinal glands on each side and the surrounding lymphatics. This procedure is not necessary for neoplasms high in the rectum or in the rectosigmoid. It is accomplished by the use of six 50 milligram applicators, each covering a

square inch of skin surface, and left in place about 14 hours. The procedure is repeated on the opposite side, this giving 6x50x14x2=8,400 milligram hours. When it is impossible to completely remove the lesion such as after posterior resection of the rectum, it is advisable to use radio-therapy immediately postoperative. This may be done by applying packs of radium directly in or over the wound. These consist of three or four 200 milligram applicators or packs placed at a distance of two inches from each other as in diagram.

In summary, it should be repeated that at present it is not justifiable to treat operable neoplasms of the rectum by radium alone since surgical methods offer better results. The treatment with radium has its greatest value when used in conjunction with surgical methods, and in carrying this out it should be emphasized that the closest co-operation should be maintained between the surgeon, radiologist and patient. Radiologic methods are not competing with surgical procedures but are of distinct aid in the palliation and cure of malignant lesions of the rectum.

Respectfully submitted,

F. A. Olson, M.D.

Secretary-Treasurer.

NEWS ITEMS

Dr. R. B. J. Schoch has recently been named as health commissioner of St. Paul.

Dr. Clarence Ochsner, Wabasha, was married last month to Miss Anita Bouquet, of Caledonia, Minn.

Dr. Charles Johnson, formerly located at Spring Valley, has moved to Wells, Minn., where he will continue his general practice.

Dr. S. A. Slater, Worthington, Minn., has returned to his office, after several weeks vacation, in visiting at Cincinnati and other southern cities.

The last summer meeting of the Western Montana Medical Society was held at Missoula last month, with a large attendance of active and visiting members.

Dr. E. S. Judd, of Rochester, was awarded the honorary degree of Doctor of Science by the University of Maryland, Baltimore, at commencement exercises last month.

Dr. H. J. Thornby, Moorhead, Minn., passed away on June 18 at the age of 72 years. Dr. Thornby had been in active practice at his home city for over 20 years.

A testimonial dinner was given by a group of professional and business friends of Dr. C. W. More, of Eveleth, Minn., recently, which was attended by over 200.

The thirteenth annual scientific and clinical session of the American Congress of Physical Therapy will be held in Philadelphia at the Bellevue Stratford, September 10-13, 1934.

The June meeting of the Park Region Medical Society was held at Alexandria, Minn., with a large attendance with Dr. F. J. Hirschboeck, Duluth, being the principal speaker.

Miss Olivia Peterson, Minneapolis, president of the Minnesota Nurses Association, was the guest speaker at a banquet and program of the Red Wing nurses association on June 15.

Dr. Elmer M. Hill has purchased the practice of Dr. Geo. R. Love, Preston, Minn., and will occupy his offices at once. Dr. Hill was a recent graduate of the University of Minnesota.

Dr. C. H. Slocumb, Rochester, was the guest speaker at the June meeting of the Mower County Medical Society at Austin, Minn. Dr. Slocum read a paper on "Newer Concepts of Rheumatic Fever."

Dr. W. A. Fansler, Minneapolis, was elected chairman of the section of "Gastro-Enterology and Proctology" at the annual meeting of the American Medical Association held at Cleveland last month.

Carleton College, Northfield, Minn., conferred honorary degrees on two prominent Rochester physicians, Edward C. Rosenow, given the degree of Doctor of Science, and Donald Church Balfour, who was made Doctor of Laws.

Dr. R. R. Hogue, who has been in active practice at Linton, N. D., for over 30 years, died at a local hospital in that city after a two-day illness of heart trouble. Dr. Houge was a graduate of Rush Medical College, and was always active in civic and professional work.

Does your heart need patching? If it does, the time is not distant when that delicate organ can be patched almost like the inner tube of an automobile tire. This revelation came from Dr. Claude S. Beck, associate professor of surgery in Western Reserve University, Cleveland, speaking at American Medical Association meeting.

Dr. Gerald S. Boquist, Minneapolis, practicing physician and instructor in medicine at the University of Minnesota, died recently at University Hospital from heart disease after an illness of two months. Born at Red Wing, Minn., October 21, 1888, he had lived in Minneapolis more than 25 years. He was graduated from the University of Minnesota.

ADVERTISERS' ANNOUNCEMENTS

SUMMER DIARRHEA IN BABIES

Casec (calcium caseinate), which is almost wholly a combination of protein and calcium, offers a quickly effective method of treating all types of diarrhea, both in bottle-fed and breast-fed infants. For the former, the carbohydrate is temporarily omitted from the 24-hour formula and replaced with eight level tablespoonfuls of Casec. Within a day or two the diarrhea will usually be arrested, and carbohydrate in the form of Dextri-Maltose may safely be added to the formula and the Casec gradually eliminated. Three to six teaspoonfuls of a thin paste of Casec and water, given before each nursing, is well indicated for loose stools in breast-fed babies. Please send for samples to Mead Johnson & Co., Evansville, Ind.

MERCK MANUAL OF THERAPEUTICS

A new edition of The Merck Manual of Therapeutics and Materia Medica was presented to the medical profession at the annual meeting of the American Medical Association, which convened in Cleveland, last month.

Therapy in the new manual has been outlined by Dr. Bernard Fantus, Professor of Therapeutics, College of Medicine, at the University of Illinois.

In the new manual, therapy has been approached, not only as a science, but as an art. For this purpose ripe experience has been culled for the practical application of what has been emphasized so frequently, that the patient should be treated as well as the disease. This feature of combining "savoir faire" with medication and accessory regimen represents a departure from stereotyped therapeutics.

From an original 250 pages in 1899, the Merck Manual has grown to 1,379 pages in the present edition. The new edition, the sixth since the founding of the publication, has been entirely rewritten, yet maintains the characteristics of preceding editions, which have made it the standard reference manual for the majority of physicians, students, pharmacists and nurses.

A substantial portion of the new manual is devoted to the etiology, diagnosis and therapy of 257 pathological conditions, alphabetically arranged.

Over 2,000 prescriptions with official constituents and metric equivalents are presented, along with a description of 475 remedies, including solubility, action, uses, average dose, preparations, contra indication, incompatibilities.

Some of the new chapters among the 257 contained in the section on therapy are: Acidosis, Alkalosis, Backache, Botulism, Caisson Disease, Celiac Disease, Coronary Occlusion, Dyspnea, Encephalitis Lethargica, Food Poisoning, Freezing, Hay Fever, Infantile Convulsions, Myasthenia Gravis, Paroxysmal Tachycardia, Polycythemia Rubra, Tularemia and Urolithiasis.

ELI LILLY & CO.

Pasteur once said, "If it is terrifying to think that life may be at the mercy of the multiplication of those infinitesimally small creatures, it is also consoling to hope that science will not always remain powerless before such enemies." Pasteur was a savant peering into the next century just as scientific observers are today glimpsing the future accomplishments of the laboratory worker.

Great as has been the progress in the field of antiseptics and germicides, progress that would have amazed Pasteur could he have seen his prediction fulfilled, the power of science is well illustrated in the development of Merthiolate, a germicidal agent produced by Eli Lilly & Co. Comparative studies place it in a favorable position among germicides as regards effects upon ciliary action and phagocytosis. Added to its preferential bacteria tissue rating, Merthiolate is said to be freely soluble in water or body fluids, to dialyze easily. Reports indicate that Merthiolate does not precipitate proteins, that it is nonhemolytic for red blood cells. Solutions are claimed to be stable. The product, according to findings, is well adapted to all types of clinical disinfection. Merthiolate is available in solution, as a colored tincture, in the form of a jelly, an ointment, and an ophthalmic ointment.

RHEUMATISM

Inflammatory conditions are by no means confined to the winter months, and rheumatism does not govern itself by the calendar. So Antiphlogistine is an all-year therapeutic agent, indicated for and often affording the most grateful relief in the treatment of articular and non-articular rheumatism.

The moist heat which it maintains for more than 12 hours, reinforced by the osmotic and phagocytic actions of its chemical constituents, tends to improve the local metabolism, promote absorption of the swellings in and around the muscular fibres, helps to restore movement in stiffened joints and muscles and to bring relief from the pain.

Antiphlogistine is indicated for the majority of inflammatory lesions, whether deep-seated or local and those physicians who are not conversant with its uses, or who may wish to give it further clinical trial, are invited to write for samples and literature. The Denver Chemical Mfg. Co., 163 Varick St., New York, U. S. A.

"OUT OF THE WOODS—BUT"

"You are out of the woods, but don't overdo it for a while." When a physician says this to a patient he generally provides a staff on which the patient can lean during the period when he will usually try and overtax his strength anyway. In other words, he will prescribe a tonic. What? While it may be true that one gargle is almost as good as another, one cannot very well say this of agents, the purpose of which is to stimulate

The JOURNAL LANCET

Minneapolis, Minnesota
July 15, 1934

New Series
Vol. LIV, No. 14

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W. G. MAGEE, M.D. .....Watertown
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J. L. STEWART, M.D. .....Nemo
J. F. D. COOK, M.D. .....Langford

MINUTES OF HOUSE OF DELEGATES

South Dakota State Medical Association in Fifty-third Annual Session—Mitchell, South Dakota

Monday, May 14, 1934
Widmann Hotel—7:00 P. M.

Meeting called to order by Dr. E. W. Jones, President, at 7 p. m. o'clock.

Roll Call by the Secretary, with the following members present: Drs. E. W. Jones, W. G. Magee, A. S. Rider, E. A. Pittenger, M. J. Hammond, C. E. Sherwood, B. M. Hart, J. C. Shirley, B. A. Bobb, N. J. Nessa, S. M. Hohf, J. L. Stewart, H. R. Kenaston, N. K. Hopkins, Chas. Flett, J. R. Westaby, J. F. D. Cook, J. D. Whiteside, J. O. F. Kraushaar, J. B. Vaughn, R. S. Westaby, H. D. Sewell, O. J. Mabee, S. A. McClellan, M. A. Stern, W. E. Donahoe, I. M. Freshour, Thos. Cruickshank, N. T. Owen, A. P. Peeke and D. A. Gregory.

Dr. Jones appointed the following reference committees:

Resolutions and Memorial Committees: Chairman, H. D. Sewell, of Huron; Ina Moore Freshour, Yankton, and D. A. Gregory, of Milbank.

Amendments to Constitution and By-Laws Committee: Dr. Thos. Cruickshank, Vermillion, chairman; N. T. Owen, Rapid City, and J. B. Vaughn, Castlewood.

Committee on Nominations and Place of Meeting: Chairman, J. D. Whiteside; J. B. Vaughn, Castlewood; R. S. Westaby, Madison; H. B. Martin, Harrold; H. D. Sewell, Huron; S. A. McClellan, Kennebec; W. E. Donahoe, Sioux Falls; Ina Moore Freshour, Yankton; F. S. Howe, Deadwood; R. J. Quinn, Burke; A. P. Peeke, Volga, and D. A. Gregory, Milbank.

Dr. Cook then presented the minutes of the 1933 session as published in the July 15, 1933, issue of the JOURNAL-LANCET, and moved that the minutes be approved as published in the JOURNAL-LANCET, without reading.

Dr. Gregory: Second the motion.

Dr. Jones: All in favor say aye. Contrary the same. Motion carried.

Dr. Cook then read the report of the Secretary-Treasurer for 1934, the membership report and a resume of the financial report to be submitted to an auditing committee appointed from the Council.

Report of Membership

From this report it is evident that there is work to be done by the District Medical Societies in procuring members. According to the by-laws of the State Medical Association, the District Medical Society is the door for membership to the State and American Medical Associations. That the District Society is the sole judge of its membership. This fact of the District Society being the entrance to membership in organized medicine, it is encumbent on the District Societies to campaign for membership in their respective districts.

You will notice from the following report of membership by districts, that each district has added from one to eight members. The Black Hills District holds the banner for membership. 48 members paid up with eight new members. Evidently "Gold in Them Thar Hills" may have

had something to do with the increase in membership. Perhaps the officers of the District have made a membership campaign of the District. Each district should contact new men in their district for membership. It has been noted in the JOURNAL-LANCET that the Black Hills Medical Society in honoring a lady with the presidency of their Medical Society was the first to do so in the state. To be correct, Sioux Falls and Yankton Societies have so honored lady members. The State Medical Association is proud of its lady physicians, who have given loyal support to local and state programs of the Association.

District	Members	No. of Paid Members	New Members	Delinquent	Eligible
No. 1	60	38	2	22	20
No. 2	25	23	4	2	5
No. 3	25	21	4	4	No Report
No. 4	11	10	1	1	No Report
No. 5	27	13	1	14	4
No. 6	37	29	1	8	38
No. 7	60	35	1	25	No Report
No. 8	41	31	1	10	16
No. 9	57	47	8	10	20
No. 10	10	9	1	1	No Report
No. 11	12	6	1	6	No Report
No. 12	22	10	1	12	No Report
	387	272	26	115	103

PAID DUES

1932	255
1933	229
1934 (to May 12)	272
Honorary Members	7

Of the 1934 membership of 272—26 are new members.

TREASURER'S FINANCIAL STATEMENT

From Ledger

1933	
May 13—Cash balance	$1,532.33
May 13 to Dec. 31—Back dues	640.00
June 1—Refund L. W. Bicknell	32.50
Dec. 31—C. D. No. 11233 and interest	105.67
1934	
January to May 12—Dues, 272 members	1,360.00
Huron and Yankton Districts over paid dues	15.00
Total cash	$3,685.64

Disbursements

May 13, 1933, to May 12, 1934	$2,376.86
May 12, 1934—Cash balance, Aberdeen National Bank & Trust Co.	$1,315.64

Other resources:

C. D. L. S. Bank No. 11538	$ 90.68	
Trust Cert., L. S. Bank 375	735.92	
U. S. Bond	500.00	
		1,326.60
Total credits		$2,642.24

J. F. D. COOK, Secretary-Treasurer

Audited and approved Huron, South Dakota, May 16, 1934.

E. A. PITTENGER
C. E. SHERWOOD

Dr. Jones: You have heard the report of the Secretary-Treasurer. Is there a motion to accept it?

Motion made and seconded that we accept the report. Motion carried.

Dr. Jones: We will now have the reports of Standing Committees. As Chairman of the Scientific Work, I offer the Scientific Program as printed and sent to you. In addition I would like to state that for the lectures of Dr. Harrington on cancer of the breast and of Dr. Heunekens on the care of infants, we had 325 extra seats and we issued tickets to the Parent-Teacher Association of Mitchell, of which there are about 700 members, and asked the presidents to distribute the tickets where they thought they would do the most good. This is offered as scientific work.

In the Public Policy and Legislation work, I might state that our greatest difficulty and work during the year was with the Relief committee and with the various relief societies in the State. We didn't accomplish a great deal, a few of them received a little money. It was stated this afternoon and stated correctly that the physicians, nurses, dentists and druggists received approximately $65,000 out of the relief set-up for a five months period, which divided among the number in the State would give them a very small amount. We complied with every request that the President of the United States and National Director of Relief made, only to have all of our requests tabled. And the relief that was issued in the medical line was a very small amount of the relief that was offered to the State in general.

I attended the Northwest Conference at St. Paul in February, and there were representatives there from Indiana to Wyoming, Nebraska, Illinois, Iowa, some 42 representatives. It was the concensus of opinion that radio broadcasting of more or less prepared speeches by members of the Medical Profession of the State was the proper and a very good thing to do. Minnesota has a very fine program. Our station WNAX was mentioned as one of the first class stations in

the middle west and we were urged to attempt to arrange a program of broadcasting as a means of keeping the profession before the public in this State as well as other states. I wrote to the A. M. A. for the material and contacted Dr. S. M. Hohf at Yankton and talked to him personally about it and he said he would take it up with the manager of WNAX. WNAX was anxious to see some of the lectures that were being used and I procured from the A. M. A. lectures that could be delivered. These were sent to Dr. Hohf and he interviewed the station and received a very favorable report. I haven't had a chance to talk with him today but with your permission I would like to defer the balance of this report until the next meeting.

Dr. Cook: The President asks that the balance of this report be deferred until the next meeting, what is your pleasure?

Dr. Westaby: I move that the President be given permission to complete his report at the next meeting.

Dr. Gregory: Second the motion.

Dr. Cook: Motion made and seconded that the report of Public Policy and Legislation be deferred until the next meeting of the House of Delegates. All in favor say aye. Contrary no. Motion carried.

Dr. Jones: Report on Publication.

Dr. Kenaston: I would like to ask that we defer this report until we finish the first meeting of the Council.

Dr. Jones: Motion made by Pittenger, seconded by J. R. Westaby that the report on Publications be deferred until the next meeting of the House of Delegates. All in favor say aye. Contrary no. Motion carried.

Dr. Jones: Report on Medical Education and Hospitals.

Dr. Owens: We have no report to make.

Dr. Jones: Report on Medical Defense.

Dr. Hohf: There is nothing of any importance that came up in the Medical Defense Committee, there was just one item that was referred to us, Ziegler of Highmore. He had a little grievance in which he came in contact with an osteopath, who seemed to be in disrepute. The President had two communications from him that were sent to me. I made an investigation and found that the Doctor is not a member of the organization and no action was taken. No other instance came up.

Dr. Jones: What shall we do with this report?

Dr. Bobb: I move that we adopt the report. Seconded.

Dr. Jones: All in favor say aye. Contrary no. Motion carried.

Dr. Jones: The report on Medical Economics. Dr. Baughman.

Dr. C. E. Sherwood: Dr. Baughman asked me to read this report for him as he was unable to be here.

Report of the committee on medical economics—

While the Committee on Medical Economics has held no formal meeting during the year the members have been giving the subject considerable thought and have been in correspondence with each other.

Regardless of the fact that the Medical Profession has operated under a code of ethics since the day of Hippocrates there seems to be an increasing tendency on the part of some of our less scrupulous members to do more or less "chiseling" particularly during these trying financial conditions. Furthermore the tendency which has always prevailed to some extent, to consider the pauper and the dead-beat as belonging to the doctor, has been especially evident during the past year. I will admit that a gesture was made under the much heralded Federal Emergency Relief plan but is there one here who has not been badly disillusioned?

The history of all schemes that have been tried both in this country and abroad, whether they be State Medicine, National Health Insurance, Workmen's Compensation or other, shows that they all become more or less of a "racket" to the detriment of both the patient and the physician. The benefits and profits invariably going to the non-medical racketeers who wax fat on the misfortunes of the patient and the hard work of the physician.

There is only one solution to the problem and it is high time that the Medical Association and individual members of the profession are waking up and taking action. The profession must supply the public with what it wants and do it now. A plan fashioned after that of the Wayne County Medical Society of Detroit, Michigan and modified and adapted to the needs of the various communities seems to me to be the best solution. In our sparsely settled state, a plan could be worked out by the State Medical Association to be administered by the component districts. It should be flexible enough to be readily adapted to fit the local condition. In such a plan the district society becomes a central coordinating center for those cases requiring assistance in obtaining and paying for complete medical service including hospitalization, dentistry, nursing and pharmaceutical service. The members of the society become

the active staff caring for patients. All forms of medical care, consultation, x-ray, and laboratory procedures are to be performed in the office or laboratory of the physician or at the hospital where he takes his patients. This plan should include hospitalization and I have no doubt that all the hospitals in the various communities would be very glad to give their whole hearted cooperation. In places where there are industrial concerns employing labor, arrangements should be made and cooperation secured from the employers to aid in working out the plan, in return for which they would be assured the very best care for the employee.

All cases entitled to the benefits of this service should be registered at the central headquarters and referred to their doctor, if they have one, and if the patient has no family physician he will be asked to select one and will then be given an identification card to be presented by him to the doctor selected.

If several doctors and/or a hospital cooperate in the care of a case the bills for the fees will be compiled into one bill and terms will be arranged according to the patients ability to pay. Payments received by the central office on accounts will be distributed to each cooperating doctor, hospital, dentist, nurse, or druggist.

This plan preserves the recognized patient-doctor relationship. The patient always has a free choice of physician and the physician has a free choice of hospital, specialists and laboratory exactly as carried on in private practice.

A very important factor of this plan is that it places complete medical service within the reach of every worthy patient and it provides an easy plan for the liquidation of the bills.

The plan should increase the health and happiness of the community as it provides a method whereby people can pay for the service now needed. It should remove a large portion of the financial reasons for a delay of medical service.

The consolidation of medical and hospital bills in addition to definite terms arranged at the time of service should result, with the cooperation of employers and all concerned, in an increased ratio of collections. Doctors and hospitals as well as all others concerned will send their bill computed at their usual fees for these patients to Society Headquarters, the doctor will not make collections, the central bureau has already made arrangements for collections. To defray the cost of operating the central bureau, 10 per cent of all monies collected will be retained by the bureau.

This plan will immediately eliminate the well known practice of many patients, of going to first one doctor and then another, staying with each as long as his credit lasts and never paying any one.

The State and District Society should be the first and only agency for carrying out preventive immunization programs, mothers' and children's clinics, pre-natal clinics, and everything pertaining to the practice of medicine and to public health. With such a plan in existence there would be less tendency for misguided lay organizations to try to gain favor in the public eye by fostering and promoting schemes and programs in which they expect the doctor to act as a cat's paw for them. The public is entitled to the full benefits of modern preventive as well as curative medicine and surgery. If we do not take the initiative and see to it that everyone is given an opportunity to become acquainted with and receive every benefit of the constantly advancing scientific medicine, groups of lay men will attempt to do it.

Physicians should all adhere strictly to the code of ethics and the Golden Rule. One should never under any circumstances charge less than the minimum agreed upon in the fee schedule and they should not hesitate to charge more than the minimum when the circumstances of the case and financial circumstances of patient will permit. It should be the duty of the physician to support their local hospital and see to it that those that can afford to do so occupy the private rooms and avail themselves of the higher priced services and accommodations offered. Any well-informed physician knows that every ward patient cared for by any hospital, worthy of the name, is receiving at least 50 per cent of his hospital care without charge and this loss falls upon the hospital. It would not be more than fair that when a physician refers a patient to the hospital for ward care that he certify that this patient is either a charity or a semi-charity patient so far as his remuneration for medical service is concerned.

County Commissioners should be informed by all practicing physicians in the various counties of the actual expense necessary to care for the indigent so that they can make a levy sufficient to cover this expense. No physician should accept an appointment as county physician unless provision is made to reimburse all other physicians for the county work that those other physicians are always obliged to do.

I would therefore as Chairman of the Committee on Medical Economics recommend that a committee be appointed to work out a definite plan for early adoption by the State Medical Associa-

tion that would be submitted to the component districts along the line suggested in this report.

J. M. Walsh
D. S. Baughman
W. F. Bushnell

Dr. Cook: I move the adoption of this report. Motion seconded. Remarks.

Dr. Bushnell: I had been notified that I was a member of the Committee of Medical Economics. Perhaps you are all aware that Economics in the Medical Profession today is an important matter. Being delegated as a member of a committee that I considered very important, I wrote Dr. Baughman, the Chairman, relative to this matter. I am quite well pleased with the wonderful report that has been given to the House of Delegates and especially in view of the fact that I offered my services as a member of the committee to elucidate any facts that are more or less in doubt. In a letter from Dr. Baughman he said I am very much in doubt about this committee and you perhaps know as much as I do, I would suggest that you report what you think about it. However, between that time and now he has evidently repored a very elaborate program.

Now, I desire to state that I have been in the State of South Dakota since the year 1910, have been a member of my district society, and the State Association all this time and I am a little ashamed of the fact that I have attended only one meeting in all that time. However, the report of these committees twenty years ago were very much like the report issued by the Medical Economic Committee tonight. I believe the medical profession are with our backs against a wall. I believe that the medical profession in the State of South Dakota should right about face and work from an entirely different angle than they have in the past. I believe today that the politicians and various associations we have today have the upper hand, there is no profession or body of men who have sacrificed their life blood and life savings as has the Medical Profession, still when the Medical body desires anything from the Political body, they are turned down, stepped on because the Politicians know they can get away with it, they know that the medical body itself is more or less a body of humanitarians who will sacrifice themselves.

I feel as a member of the committee on Medical Economics there is no time for us that is more apropos than now for real serious study. Take for example the medical relief isued in this State, or in any other state, but particularly South Dakota. You have accepted commands from men who probably in ordinary life were the equal of a ditch digger, you were told when you see a person suffering from various diseases, when you should visit him, how often you should visit him, etc., and how much you had coming. Now, as to accepting or receiving such a report as this Medical Economics committee has presented here, I doubt very much whether anyone of you can remember two sentences that were in that report that was read tonight. That report is according to Hoyle. Twenty-three years ago I heard the same thing, but we should get down to real facts and turn about face and do something different. Let us as a medical profession assume the same tactics that fellows in other organizations are doing and getting results, when we get stepped on. I haven't any plan to offer you tonight, I am merely feeling that I should voice a thing that we all feel in our hearts should be voiced.

A general discussion entered into by a large number of the members followed Dr. Bushnell's remarks, as to a program to be carried on by the Association, mentioning that such things as the clinics sponsored by the 40 & 8, American Legion, Welfare Department, etc., should really be approved by the District Medical Society, and the State Medical Association, that lay organizations get the credit and glory for these things and they ask the medical profession to do the work for them for nothing. It was mentioned by Dr. Jones that the present situation is a test of organized medicine, that we have got to have the membership in the Association to succeed.

In discussing the 40 & 8 clinic to immunize children, some felt that the Doctors should refuse to take any part in it, while others felt that they should not refuse where they were already to go ahead with the work, but should do their best to protect the children. It was felt that something should be done so that the medical Association should have something to say about the work of the State Board of Health, the State Welfare work and various clinics held. Dr. Jones suggested getting some of the members of the Association into the legislature, enough to do some good. That all public welfare programs be submitted to the medical profession for their approval as their co-operation is required in the completion of the work. Example—the type of program adopted by Wayne County Medical Society of Detroit, Michigan. This type of program is worth the careful study of all. Read *"The Physician as Health Worker"* by L. O. Geib, M.D., Page 366-368, Journal A. M. A., August 8, 1931.

Dr. Jones: What shall we do with this report. There is a motion to accept it. All in favor say aye. Contrary the same. Carried. The report is accepted.

Dr. Jones: I will now appoint a Committee. Dr. Donahoe, chairman; Dr. Bushnell and Dr. O. J. Mabee, to whom the above report will be referred.

Dr. Jones: The next matter for consideration is the Report of the Hygiene Committee.

Dr. I. M. Freshour: We did not have a formal meeting, it was difficult to get together, but I have a report prepared.

Report of Committee On Hygiene

Your committee on Hygiene begs leave to submit the following report for the past year.

It is from the Department of Child Hygiene under the direction of Doctor Lottie G. Bigler that the data for much of this report is made available.

During the early part of the current year over the State generally have occurred epidemics of Measles, Mumps and Whooping-cough. Considering, however, the drouth and devastating dust storms, hygienic conditions generally have been good.

During three months of the summer of 1933 Dr. Lottie Bigler, now Director of the Division of Child Hygiene, conducted Pre-school Clinics throughout the various counties. That work is continued again this summer. To date practically no Mantoux testing has been done. Funds are only sufficient to make about 2,000 tests. Dr. Bigler will make 1,000 of these and the remainder will be made on school children. Disregarding the pre-scholars, there are about 300,000 school children in the state; hence, funds for carrying on this test are very inadequate; however, it is an excellent start in determining cases of tuberculosis. Cases are selected for the Mantoux test where there is a history of persistent cough, where there are possible contacts in families having a history of tuberculosis and in markedly undernourished children. The immunization is confined to those whose parents cannot affort to pay for it. Many of the others have promised to take the children to the family physician. During the pre-school clinics every defective case also is referred to the family physician.

One of the most worthy causes undertaken by the State Board of Health is the work for crippled children. To further carry on this work Dr. Bigler has been collecting funds from every organization in the state—churches, various societies and fraternal organizations, women's clubs, the auxiliaries to the medical societies, both district and state, 4-H club, and pennies from school children. All funds raised in the counties will be matched in state funds to be spent in that particular county in which the funds are raised. The committee asks the hearty co-operation of the physician of the state in helping to further this work.

In January, 1934, through the relief administration and the Child Health Nursing project, division of Child Hygiene, a State Supervisor, six district supervisors, and eighty-two field nurses were appointed. These nurses are making a general survey of hygienic conditions in the home. Children are examined for defects and instructed in the care of the teeth, keeping the body clean and of the care required in handling food.

In view of the excellent manner in which the department of Child Hygiene has been conducted under the guidance of a woman physician and because the national organization favors it, your committee recommends that the department be left permanently under such director and asks that the medical society endorse it.

Your Committee regrets to report that nothing whatever has been done in the field of mental hygiene. In view of the fact that mental hygiene and mental health are so closely allied to all the fields of medicine, it is suggested that the House of Delegates recommend to the incoming President and Scientific Program Committee, that a part of each yearly program be given over to a paper or papers on mental hygiene and mental medicine.

Ina Moore-Freshour, Chairman
Goldie Zimmerman
M. J. Hammond

Dr. Jones: And discussion?

A discussion was had as to the necessity, importance and value of the tuberculous test among children, unless an efficient program of follow up for contacts in the home was carried out, authorities were quoted. Further discussion as to the various lay organizations conducting clinics and immunizing children and making Mantoux tests was had.

Dr. Magee: I move that Dr. Freshour revise her report with the assistance of two other members to be appointed by the President.

Dr. Gregory: Second the motion.

Dr. Jones: All in favor of the motion, say aye. Contrary the same. Motion carried. This

Committee will report at the next meeting of the House of Delegates.

Dr. Jones: Report of the Cancer committee, Dr. Ball.

Report of Committee On Cancer

Your committee, acting on a resolution adopted at Huron State Meeting, May 16, 1933. "That a program for an educational campaign to further the knowledge of the diagnosis and treatment of cancer as recommended by the American Society for Control of Cancer, be supported by the Cancer Committee of South Dakota State Medical Association," beg to submit the following report:

The period of one year has been concentrated on Cancer of the Breast. Under date of Sept. 22, 1933, all district secretaries of the state were contacted by letter as to the above resolution and program, and requested to devote one entire program exclusively to the subject of Cancer of the Breast.

In October 1933 your chairman personally contacted Dr. Estabrook of the New York office of the American Society for the Control of Cancer and received from the home office literature, etc., on Cancer of the Breast programs. Twelve sets were mailed Nov. 13, 1933 (one set to each district secretary).

To date we have been advised that two-thirds of the districts have complied with the request, having had one program devoted to Cancer of the Breast. Three societies having had out of state men on the programs and invited graduate nurses and medical students.

To end the years work Dr. S. W. Harrington, head of section on Surgery, Mayo Clinic, will give a Surgical Clinic, Cancer of the Breast, and a paper "The Surgical treatment of Carcinoma of the Breast," May 16, at the Mitchell State Meeting.

Interest has been stimulated among the graduate nurses by distributing pamphlets, also lectures on cancer have been held for various groups of nurses. Several lay press items have been published.

Your committee recommends that further study of cancer be continued as outlined by the American Society. Second year suggested program being "Symposium of Tumors of the Uterus." The records show that death from cancer is increasing in South Dakota as well as in other states. The record clerk reports 399 deaths for the year 1922 and 567 deaths for the year 1932.

We further recommend that since the diagnosis of Cancer of the Breast is so difficult that a joint judgment is usually better than any one man's opinion, no one step can yield larger dividends in behalf of the cancer patient than the establishment of diagnostic clinics where groups of physicians meet at regular intervals to discuss cases and to determine the proper treatment to be applied.

The steady yearly increase in the cancer rate in South Dakota demands a careful consideration of the treatment of this disease at the present time. A careful survey reveals that need of greater development of radio-theropeutics in our larger hospitals and medical centers. We feel that the medical profession should encourage more of its members to acquaint themselves with the proper application of Deep X-ray and Radium therapy.

The question arises as to the comparative value of radium element and radon. The opinions received from men who have had the largest experience in this country are not in complete harmony since some prefer radium element while others use radon almost exclusively. That the same results can be achieved with either radium element or radon is universally admitted also that radon is much more plastic as to quantities and shapes of applicators and requires much less skill in application.

The fact that emanation from radon seeds is spread over a longer period of time (10 days) would seem to be an advantage in as much as mitotic cells are the most susceptable.

For the smaller hospitals there is economic advantage of obviating the initial cost of acquiring radium element as long as radon can be secured from emanation plants at a fair price. There is also the advantage of no fear of loss by accident or otherwise of the costly element.

We present the above report for approval and consideration.

Respectfully submitted
W. R. Ball, Chairman
J. D. Whiteside
N. J. Nessa

Motion made and seconded for adoption of the report.

Some discussion as to the use of radium was had. Dr. Westaby announced that the Province of Saskatchewan had bought up all the radium in the Province and it was administered by an expert hired by the Province, co-operating with the medical profession.

Dr. Jones: All in favor of the adoption of Dr. Ball's report, say aye. Contrary the same. Motion carried.

Dr. Jones: Next is the Necrology Report.

Secretary Cook read the report of Committee on Necrology.

Report of Committee On Necrology

Your Committee on Necrology reports that there has come to our attention the death of the following, who were members of this Association:

Francis Marion Crain, Redfield, S. Dak., Past President.

Robert Thomas Dott, Sioux Falls, S. Dak., Past President.

Andreas A. Wipf, Freeman, S. Dak.

Maurice Geo. Albert Milan, Aberdeen, S. Dak.

Robert Archie Crawford, Chamberlain, S. Dak.

and that those listed below, who were not members of this Association, were, nevertheless, fellow followers of our Healing Art, and have labored probably as honestly and as faithfully as any others, and have also passed on to their reward:

Sigmond Rosenthal, Aberdeen, S. Dak.

Osmond Nason Hoyt, Long Beach, Calif.

Francis Asbury Bryant, Herrick, S. Dak.

Herman August Dohl, Clear Lake, S. Dak.

Horace M. Champney, Belle Fourche, S. Dak.

Albert E. Hofer, Marion, S. Dak.

Leslie Grant Hill, Newton, Iowa.

Your committee asks permission to read and to have incorporated in the recorded minutes of this session, as a tribute to our friends and brothers who have made the crossing, the immortal lines from the inspired pen of Alfred Lord Tennyson, "Crossing the Bar."

Crossing the Bar

Sunset and evening star,
And one clear call for me!
And may there be no moaning of the bar
When I put out to sea.

But such a tide as moving seems asleep,
Too full for sound and foam,
When that which drew from out the boundless deep
Turns again home.

Twilight and evening bell,
And after that the dark!
And may there be no sadness of farewell
When I embark.

For though from out our bourne of Time and Place
The flood may bear me far,
I hope to see my Pilot face to face,
When I have crossed the bar.

—*Alfred Tennyson.*

L. J. Pankow
Thos. Cruickshank
W. H. Saxton

Dr. Cook: Move the adoption of the report.

Second the motion.

Dr. Jones: All in favor of the adoption of the report say aye. Opposed the same. Motion carried.

Dr. Jones: The Advisory Committee Co-operating with the State Board of Health has no report, Dr. Young, chairman, advises me.

Dr. Jones: Advisory Committee Co-operating with South Dakota Public Health Association.

Dr. Pittenger: I move that we defer the report of the Advisory Committee Co-operating with South Dakota Public Health Association until Wednesday morning. Motion is seconded.

Dr. Jones: All in favor say aye. Opposed the same. Motion carried.

Dr. Jones: Editorial Committee of Journal-Lancet.

Dr. Hohf: Nothing to report any more than a request for renewal. As chairman of the committee I recommend that it be renewed. I move that it be renewed on the same terms.

Motion seconded and duly carried.

Dr. Jones: Report of Committee on Military Affairs.

Dr. Gregory: I received one notification from the Secretary of the State Medical Association that I was appointed on that committee. I have received no notices of a meeting from the chairman and know nothing further.

Dr. Jones: Report of Advisory Committee to Woman's Auxiliary. The first Auxiliary in the United States was organized in South Dakota, at Hot Springs, and was originated by Mrs. R. D. Jennings, of Hot Springs. I move that this State Association send an appropriate floral remembrance to Mrs. Jennings.

Dr. Hopkins: Second the motion. Motion carried.

Dr. Jones: I would like to state that the ladies in the city have a very fine program of entertainment for the visiting ladies, and it is arranged to start at ten o'clock.

Dr. Jones: Any new business. We should have a committee on the question of dues.

Dr. Cook: I move that the chair appoint a committee to consider the question of dues and report at the next meeting of the House of Delegates. That the dues for 1935 be five dollars ($5.00).

Dr. Stern: Second the motion.

Dr. Jones: All in favor of the motion say aye. Contrary no. Motion carried.

Dr. Jones: I will appoint Drs. M. A. Stern, of Sioux Falls; J. O. F. Kraushaar, of Aberdeen, and H. D. Sewell, of Huron.

Dr. Cook: I have a communication from the University of South Dakota relating to the Frederick Angier Spafford prize in Virgil and the awards were as follows:

Vermillion, S. Dak.
April 30, 1934.

Dr. J. F .D. Cook, Sec.-Treas.,
South Dakota State Medical Assn.,
Langford, S. Dak.

My dear Sir:

Your letter of April 26 has been referred to me to be answered. The Frederick Angier Spafford Prize has been awarded since the Commencement of June, 1929. The following students have been the recipients:

1929—Mamie Waara, Buffalo, S. Dak.
1930—Dorothy Cole, Madison, S. Dak.
1931—Agnes Schmit, Castlewood, S. Dak.
1932—Ervie Lovejoy, Vermillion, S. Dak.
1933—Ruth Waggoner, Philip, S. Dak.

Sincerely yours,

(Signed) J. H. Julian,

Vice-president University of South Dakota.

Dr. Jones: Under new business we have the matter of Resolutions.

Dr. Cook read the following Resolutions for consideration by the Resolution Committee.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION

Fifty-third Annual Meeting—Mitchell, S. Dak. May 14-15-16, 1934

Resolution for the President of the United States of America

The South Dakota State Medical Association at its annual meeting held in Mitchell, South Dakota, May 14-15-16, 1934, passed the following resolution:

Inasmuch, As many of its members were in service during the Great War, it is deemed proper to give expression to our views regarding medical problems which might be the outcome of that event.

Further, We are deeply interested in the progress of the science of medicine and are concerned in the application of this knowledge, so that the science and the art in medicine shall be preserved and advanced in the interest of all.

THEREFORE, We commend the policy and activity of the American Medical Association, opposing free hospitalization and free medical care on the part of our government for veterans with non-service-connected disabilities, and we also wish to commend the Nation's President's economy program as announced by him regarding this question. We earnestly oppose any serious effort to revert to the method which has grown up, whereby non-service-connected disability claims were allowed, burdening the government with ever-increasing costs for hospital building and free medical care.

House of Delegates,
South Dakota State Medical Assn.
May 14. 1934

SOUTH DAKOTA STATE MEDICAL ASSOCIATION

Fifty-third Annual Meeting—Mitchell, S. Dak. May 14-15-16, 1934

Whereas, Investigations reveal information that nutritional deficiency is constantly assuming a more important role as the etiological factor of many diseases that have heretofore not been understood; and as it is now known that there are present in the United States a great many diseases belonging to this group, some of which diseases are widespread, increasing in number and are seriously undermining the health and vitality of the people of this country; and

Whereas, We have little definite knowledge of the chemistry of our foods, because analyses which have been made in order to determine their nutritional value have been local or sectional and no sustained effort has been made upon a broad scale to supply such information as is necessary in order to determine the localities from which our food supply should be drawn; and

Whereas, It is known that in certain localities and under certain circumstances, the chemical elements of common foods, such as milk, fruits, vegetables and cereals, show marked differences in value while it is known that in other localities certain vegetables absorb poisonous substances which render them of doubtful food value; and

Whereas, No real progress can be made in the solution of nutritional deficiency diseases until chemical analyses of foods are made upon a broad and impartial scale and the relationships of the different chemical elements studied with scientific care; and

Whereas, The whole scientific world is aroused to the importance of this fundamental work in order that grave public health problems and the vitality and strength of the people of this nation be safeguarded;

Therefore, Be it Resolved,

(1) That the Federal authorities be urged to undertake this work upon a broad, comprehensive and impartial scale in collaboration with selected

medical colleges in the different sections of the country.

(2) That the South Dakota State Medical Association urge that this work be undertaken at the earliest possible moment.

(3) That the South Dakota State Medical Association request the co-operation of all other state and national medical associations in this country.

(4) That the South Dakota State Medical Association appoint a committee whose duty and purpose it shall be to confer with the National authorities at the earliest possible moment and proceed with the work.

Resolution Opposing the Exploitations of Drugs, Remedies, Etc., Over the Radio

Whereas, The health of the citizens of the United States constitutes the greatest asset of the Nation, and the responsibility of conserving the health of the citizens and restoring them to health in times of illness reposes in the Medical Profession, and,

Whereas, This responsibility is very great as is evidenced by the high educational and professional standards which physicians are required to meet in the various states of the Union before being permitted to diagnose disease and treat the sick, and,

Whereas, Satisfactory and safe service of this type can only be rendered after a long and careful study of the causes and symptoms of disease, and that these causes and symptoms can only be determined after an interview with a physical examination of the patient, and,

Whereas, No rational or safe treatment can be decided upon and carried out under circumstances other than those above set forth without danger to the life or health of the patient, and

Whereas, For many months past the Radio Broadcasting Companies of the United States have through their various broadcasting stations permitted the exploitation of many drugs, preparations, patent medicines and so-called cures, to the radio audiences of America, and,

Whereas, It has been well established that some of the drugs, preparations and patent medicines so exploited are dangerous in the hands of the layman; others are of doubtful value, and in practically all instances their value for the relief of the symptoms and conditions for which recommended have been overstated and are misleading to the public, and,

Whereas, The symptoms and conditions for which these drugs, preparations and patent medicines are recommended may be, and frequently are, indications of serious conditions calling for careful study on the part of a well qualified physician in order that a correct diagnosis may be made, and the proper treatment instituted before the disease reaches an advanced stage, and,

Whereas, Radio broadcasting is under the control of the Federal Radio Commission, and the radio is being used to broadcast nonsupportable claims and statements regarding a large number of drugs and preparations for the treatment of human ailments:

THEREFORE, BE IT RESOLVED, That the South Dakota State Medical Association is opposed to the advertising, recommending or in any way exploiting over the radio any preparations, remedies, medicines or appliances for the treatment of human ailments; and that a copy of these Resolutions be forwarded to the Federal Radio Commission with a request that in the interest of the health of the citizens of the United States they exercise their authority to discontinue such advertising over the radio.

BE IT FURTHER RESOLVED, That physicians use such influence with their patients and with the public as may be necessary to secure their co-operation in sending protests to the Federal Radio Commission and to broadcasting stations against misleading and unwarranted medical advertising.

That as recommended by the American Medical Association, we include Mental Health with the Standing Committee on Hygiene.

It is recommended the District Societies establish a Standing Committee on Mental Health.

Dr. Cook: I move that the above Resolutions be presented to the Committee on Resolutions.

Motion seconded.

Dr. Jones: All in favor say yes. Opposed no. Carried.

Dr. Pittenger: We have to present some resolutions suggested in the Council Meeting today.

Dr. Hopkins: I move that the resolutions which are to be drafted and presented by the Council tomorrow be made legal.

Dr. Cook: Second the motion.

Dr. Jones: All in favor say aye: Contrary, no. Motion carried.

House of Delegates adjourned until meeting Wednesday, 16th, at 7:00 A. M.

MINUTES OF HOUSE OF DELEGATES

South Dakota State Medical Association in Fifty-third Annual Session—Mitchell, South Dakota

Wednesday, May 16, 1934
Widmann Hotel—7:00 A. M.

Meeting was called to order by Dr. Jones and roll call of members had. Those present as follows: Drs. E. W. Jones, W. G. Magee, A. S. Rider, J. F. D. Cook, M. J. Hammond, B. M. Hart, J. C. Shirley, N. J. Nessa, S. M. Hohf, N. K. Hopkins, Chas. Flett, J. R. Westaby, W. A. Bates, J. D. Whiteside, J. B. Vaughn, H. D. Sewell, O. J. Mabee, S. A. McClellan, M. A. Stern, W. E. Donahue, Ina Moore Freshour, Thos. Cruickshank, F. S. Howe, E. C. Smith, A. P. Peeke, D. A. Gregory.

Minutes of meeting of May 14th read and approved on motion.

Continuation of Report on radio broadcasting requested by Dr. Jones at last meeting given by Dr. S. M. Hohf, of Yankton, as follows:

As Dr. Jones has indicated, the A. M. A. is anxious that medical broadcasting be done, and with that in view he has started the movement in behalf of the South Dakota State Medical Association. This is the present status. I saw the management and owner of WNAX, and the first thing they wanted to know off the bat was how much time do you want and what would it consist of. They are of course in the business for money, and were a little bit reluctant to commit themselves right away without further consideration and information on the free proposition. So I communicated with your president with the request that he send copies of subjects and the educational part of the program that would be broadcast, stating that I had the word of the manager that anything that was of an educational nature of public interest they were always glad to co-operate and give their time and do all they could free. I submitted copies of talks that had been given by the A. M. A., they looked it over very carefully and reported that they would gladly give us the time. There are two periods which might be available for medical broadcasting, one was on Sunday evening from six to seven and the other Wednesday evening from seven to eight. We could pick our minutes in those two periods. D. B. Gurney, the owner, made this statement in which I fully agree. He said, if this is done he would suggest that we concentrate on one individual to do the talking as he said, you know, it is a certain psychological fact that the public becomes acquainted with a certain individual, his voice, his manner of talking and it either appeals to or repells, and he said I would suggest that the Association procure someone who would do the talking, and I agree with him. Now personally, ladies and gentlemen, I am opposed to this unless we can develop a program that will extend over a considerable period of time. I don't believe we will get anywhere if we just give three or four talks. I believe we should continue with these for at least a year, I don't believe fifteen or twenty minutes a week for a year would be too much. We must also bear in mind that the A. M. A. already broadcasts regularly over both the Columbia and National system, and that WNAX hooks up with the Columbia weekly. I don't think we should broadcast the same things but something that has not yet come through the A. M. A. broadcasts over the Columbia System.

Discussion.

Dr. M. A. Stern moved that the present committee, consisting of Dr. Jones and Dr. Hohf, who have been working on the broadcasting matter, should be continued, with full power to act.

Seconded by M. J. Hammond.

Motion carried.

Dr. Jones: Report of the committee appointed to consider the Medical Economics report, Dr. Donahoe, chairman.

Dr. Donahoe: The Medical Economics Committee Report was accepted as read I believe and it was referred to us for consideration. The meat of the whole thing was in the last three lines, recommending that a committee be appointed, etc. Your committee discussed this for a long time and we recommend as follows:

Report of Sub-committee On Medical Economics

The committee appointed by the president to bring a subsequent report on medical economics, recommends that a committee of three be appointed to serve for a period of three years, with sufficient funds placed at their disposal to arrange a definite and legal plan for the conservation of the integrity of the medical profession of the state of South Dakota.

Further, that this committee be empowered to contact and co-ordinate all organizations in welfare work wherein it affects the medical profession, and that the different district societies consult with this committee in contemplating any medical program for the care of the indigent poor.

Will E. Donahoe
Wm. F. Bushnell
O. J. Mabee

I move the acceptance of this report.

Dr. Westaby: Seconded.

Dr. Jones: Motion made and seconded that this report be accepted, all in favor say aye. Contrary. Motion is carried.

Dr. Jones: We will have the report of Dr. Freshour on Hygiene.

Dr. Freshour: Dr. Jones told me to select my own committee to go over this report, and I decided to select the original committee, which was Dr. Hammond and Dr. Zimmerman and myself, and we decided to leave the report just as it is besides possibly a few dots and dashes which are added which are not important, and I move the report be adopted as read.

Dr. Sewell: Seconded.

Dr. Donahoe: I wish to renew my objections to the report which I made Monday. Our troubles are with the State Board of Health, and this report asks for our approval of their conduct, and it seems as though we are fighting within ourselves on this thing.

Dr. Jones: Any further discussion? Are you ready for the question? All in favor of the acceptance of that report please stand. Contrary the same. I believe I will ask for a Roll Call vote on that: Dr. Jones, yes; Dr. Magee, no; Dr. Rider, yes; Dr. E. A. Pittenger, absent; Dr. Hammond, yes; Dr. Sherwood, absent; Dr. Hart, yes; Dr. Shirley, no; Dr. Bobb, absent; Dr. Nessa, no; Dr. Hohf, yes; Dr. Stewart, absent; Dr. Kenaston, absent; Dr. Hopkins, absent; Dr. Flett, yes; Dr. J. R. Westaby, no; Dr. Bates, absent; Dr. J. D. Whiteside, yes; Dr. Vaughn, no; Dr. Westaby, absent; Dr. Martin, yes; Dr. Sewell, yes; Dr. Mabee, absent; Dr. McClellan, no; Dr. Stern, no; Dr. Donahoe, no; Dr. Freshour, yes; Dr. Cruickshank, yes; Dr. Howe, yes; Dr. Stewart, absent; Dr. Owen, absent; Dr. Smith, yes; Dr. Peeke, no; Dr. Gregory, absent; Dr. Cook, no.

Dr. Jones: The vote is thirteen for and ten against. The motion is carried and the report accepted.

Dr. Jones: Report of Committee on Amendments to the Constitution and By-Laws.

Dr. Cruickshank: No report.

Dr. Jones: Report of Resolutions and Memorials.

Report of Committee On Resolutions and Memorials

BE IT RESOLVED: That the South Dakota State Medical Association feels deeply the loss of its members, as cited by the Committee on Necrology, and furthermore

BE IT RESOLVED: That this Association wishes to express to the widows and families of our departed brethren our sincere sympathy in their bereavement, and your Committee requests the secretary of this body to so inform each family and that this resolution be spread upon the minutes of this Association.

H. D. Sewell
Ina Moore-Freshour
D A. Gregory

BE IT RESOLVED: That the South Dakota State Medical Association in convention assembled feel duly grateful to the Sixth District Medical Society for the wonderful Scientific Programme and warm hospitality and wish to express to them their sincere appreciation in their efforts to make this convention one of the very best that the State Association has ever had.

H. D. Sewell
Ina Moore-Freshour
D. A. Greory

Resolutions accepted.

Dr. Magee: We will have report of Dr. W. A. Bates, Delegate to American Medical Association.

Report of Delegate to A. M. A., 1933

The House of Delegates was called to order at 10:00 a. m., June 12, 1933, with Speaker Dr. F. C. Warnshuis presiding.

Dr. Edward C. Cary, president of the American Medical Association spoke on the activities during the past year and the work done. The officers worked faithfully with the legislative committee down at Washignton with the result that the gratuities to the veterans were greatly reduced and an order was given to the medical officers of the Veterans Hospital by General Hines that all of those veterans who were well or could be properly discharged from the hospitals be sent home and this order resulted in the discharge of about 15,000 patients up to June 3, 1933. Of course, had it not been for the depleted treasury and the economic situation this result would not likely have been accomplished and should this situation become improved before this policy is well established, a return to the liberal care of non-service connected disabilities and many new government hospitals with the re-establishment of the abuse of government aid to which we have objected would result. Hence, it is necessary for the members of our profession to continue their opposition or we shall be confronted with the same situation as existed before Congress gave its support to the request of the courageous President of our country.

There are now in the Veterans Service 41,000

beds, but plans are being carried out to use many of these beds for domicitiary care rather than hospitalization.

Dr. Dean Lewis, president-elect, in commenting on the veterans' situation said this: "There is no argument as to the responsibility of the government in the care of the service-connected disability, nor as to the responsibility of the government to the widows and orphans of those who were sacrificed in battle. But any man discharged from the army who is able to make his living has no lien on the government."

The report of the secretary showed that on April 1, 1933, we had 62,495 members on the roster of our Association, as compared with 64,712 for the year before. The report also gave the number of physicians in each state in the directory; members of the State Association and of the A. M. A. with South Dakota showing 585 members in the directory, 240 members of the state society April 1, 1933, and 198 members of the A. M. A. This is surely not a record to be proud of.

In the report of the legislative activities showed the various medical bills that became laws last year, the following were noted: In Louisiana a bill passed defining osteopathy as "the treatment of disease, infirmity or deformity, defect, ailment or injury of a human being, without the use of drugs, except antiseptics and anodynes, by manipulations applied to nerve centers, bones, muscles or ligaments. This is in accord with the pretentions of this cult."

In North Dakota a bill was passed which defines osteopathy as "the art and science of applied therapy as heretofore or hereafter taught by recognized colleges of osteopathy, except major surgery." This is more in accord with the aspirations of the osteopaths these days.

In Arizona the chiropractors made a determined effort to procure the rights of nonsectarian practitioners but were defeated at the polls. Basic science laws were passed in Arizona and Oregon.

In the report of the Judicial Council, it was recommended and passed that Chapter 11, Article VI, Section 2 of the principles of Medical Ethics be revised by adding the following: "By the term 'contract practice' as applied to medicine is meant the carrying out of an agreement between a physician or a group of physicians as principals or agents and a corporation, organization or individual to furnish partial or full medical services to a group or class of individuals for a definite sum or a fixed rate per capita. Contract practice per se is not unethical. However, certain features or conditions if present made a contract unethical among which are:

1. When there is solicitation of patients.
2. When there is underbidding to secure the contract.
3. When the compensation is inadequate to assure good medical service.
4. When there is interference with reasonable competition in a community.
5. When free choice of a physician is prevented.
6. When the condition of his employment makes it impossible to render adequate service to his patients.
7. When the contract because of any of its provisions or practical results is contrary to sound public policy.

Each contract should be considered on its own merits and in the light of surrounding conditions. Judgment should not be obscured by immediate, temporary or local results. The decision as to its ethical or unethical nature must be based on the ultimate effect for good or ill on the people as a whole.

Regarding the majority report on the cost of medical care which you are all familiar with and the wide-spread notoriety given it, the many articles published in current magazines and also the fact that the majority of the people who secured data for this report were of the Brain Trust order. The House of Delegates was wise in condemning this sort of thing and adopting the minority report. The membership was considered and the A. M. A. has tried in every way to keep it up, first by supplying a real medical journal and second, by giving all of the benefits of organized medicine to every physician in the country.

It is the duty of every officer and member of the district or county medical society to see that every eligible physician in his district has the benefits of membership put up to him and his membership secured. The larger our membership, the greater our influence in both our state legislature and the federal congress.

Due to the fact that the full report of the proceedings of the House of Delegates at the Milwaukee meeting has been published in the Journal of the American Medical Association and that you are familiar with the reports made and adopted, only a few of the more important items are mentioned.

It is the opinion of your delegate that an attempt has been made by the American Medical Association during the past years to carry out a very large program of activities which has been

so large and so varied as to make it impossible to do justice to the subjects considered.

Respectfully submitted,
W. A. Bates, M.D.
Delegate A. M. A., 1933.

Dr. Magee: We will have the report of the Dues Committee, Dr. Stern, chairman.

Dr. Stern: Your committee recommends that the dues be left as they were this year, for 1935, and so moves.

Dr. Sewell: Second that motion.

Dr. Magee: Moved and seconded that dues be left the same, all in favor signify by usual sign. Contrary. Motion carried.

Dr. Magee: We will have the report of the Nominating Committee.

Report of Nomination Committee

Your committee begs to report the following nominations:

President-elect—A. S. Rider, of Flandreau, elected; J. E. Bruner, of Aberdeen.

Vice-president—J. L. Stewart, of Nemo, elected; Guy E. Van Demark, of Sioux Falls.

Councilor Tenth Ditsrict—H. R. Kenaston, Bonesteel, elected.

Councilor Kingsbury Co. Dist.—N. K. Hopkins, Arlington, elected. Unexpired term of A. E. Bostrum.

Delegate A. M. A.—J. R. Westaby, Madison, elected.

Alternate A. M. A.—J. F. D. Cook, Langford, elected.

Place of Meeting—Pierre District invites the Association to Pierre for 1935; 16 votes.

Sioux Falls District invites the Association to Sioux Falls for 1935; nine votes.

J. D. Whiteside, Chairman
J. F. D. Cook, Secretary

Members present: J. D. Whiteside, chairman; H. B. Martin, S. A. McClellan, F. S. Howe, J. B. Vaughn, R. S. Westaby, W. E. Donahoe and D. A. Gregory.

Dr. Whiteside: I move that the name of J. E. Bruner be removed from the report as a candidate for office of president-elect, as he does not care to serve and it was placed there for the reason that we are supposed to have two candidates.

Dr. Westaby: Second that motion.

Dr. Vaughn: I move that we suspend our By-Laws and instruct the secretary to cast a unanimous ballot for Dr. A. S. Rider as president-elect.

Dr. Hammond: Seconded.

Secretary casts the unanimous ballot for Dr. A. S. Rider as president-elect.

Dr. Whiteside: I would ask to withdraw the name of Dr. Van Demark from the report as a candidate for vice-president, as he would not accept.

Dr. Hohf: I move the rules be suspended and the secretary cast a unanimous ballot for Dr. J. L. Stewart as vice-president.

Dr. Hammond: Seconded.

Dr. Magee: All in favor signify by the usual sign. Contrary. Motion carried.

The secretary so casts the unanimous ballot of this association as requested for Dr. J. L. Stewart as vice-president.

Dr. Magee: Dr. Kenaston, of Bonesteel, for councilor from the 10th District is next.

Dr. Freshour: I move that Dr. Kenaston be elected as councilor from the 10th District.

Dr. Stern: Seconded.

Dr. Magee: All in favor signify by the usual sign. Contrary. Motion carried.

Dr. Magee: The next is Charles Flett, of Milbank, for 12th District.

Dr. Sewell: Same motion. Seconded by Westaby. Carried.

Dr. Magee: N. K. Hopkins, of Arlington, for the 11th District.

Dr. Hammond: Same motion. Seconded by Westaby. Carried.

Dr. Magee: We next vote on delegate to the A. M. A. J. R. Westaby, of Madison, is nominated.

Dr. Hohf: I move his election as delegate. Seconded by Dr. Freshour. Motion carried.

Dr. Magee: For alternate Dr. Cook, of Langford, is nominated.

Dr. Sewell: Same motion. Seconded by Dr. Rider. Motion carried.

Dr. Magee: Our next consideration is the place of meeting. We have two invitations, Pierre and Sioux Falls. Prepare your ballots for the place of meeting. Tellers reports Pierre 16 votes, Sioux Falls, 9 votes.

Dr. Magee: Pierre received 16 votes and Sioux Falls 9. We go to Pierre next year.

Dr. Cook: The Auditing Committee, Pittenger, Sherwood and Bobb, is requested to meet me immediately after this meeting to audit the books.

A talk by Dr. Finn Koren, of Watertown, was given on cancer, "The Necessity of Cancer Diagnostic and Treatment Centers for South Dakota.

Motion to adjourn, seconded and carried.

Minutes of Council Meeting

Dr. Jones: Before turning the meeting over to the chairman, I would like to make an announcement. There is a representative here from the

governor's office, concerning the set-up we have had in Federal Relief work. Dr. Cook and I had a little private meeting with him last night and we invited him to meet the council at five o'clock this afternoon. The governor has called a conference of a number of medical men of the state Thursday, 2:00 p. m., at Pierre regarding the medical relief set-up. The authorities at Pierre have apparently just awakened to the fact that the medical men of the state were to be considered. That physicians have not received adequate consideration for services rendered as outlined in Bulletin No. 7 of F. E. R.

Dr. Kenaston, chairman of the Council, presiding. On roll call the following were present: Drs. E. W. Jones, W. G. Magee, A. S. Rider, J. F. D. Cook, E. A. Pittenger, M. J. Hammond, C. E. Sherwood, B. M. Hart, J. C. Shirley, B. A. Bobb, N. J. Nessa, S. M. Hohf, J. L. Stewart, H. R. Kenaston, N. K. Hopkins, J. R. Westaby and W. A. Bates.

Dr. Cook, secretary, then read the minutes of the meeting of the Council in 1933, together with the report of the committee appointed to confer with Mr. W. L. Eales, October 17, 1933. Also minutes of called meeting of the State Council held at Huron, December 1, 1933, and a report of the committee which has been appointed to confer with Mr. Eales and consider correspondence at their meeting on December 7th.

Council Meeting

Huron, S. Dak., October 12, 1933

A meeting of the Council of the South Dakota State Medical Association met at the call of the president, E. W. Jones.

Members present: E. W. Jones, H. R. Kenaston, B. A. Bobb, J. C. Shirley, B. M. Hart, A. S. Rider, M. J. Hammond, J. F. D. Cook. P. D. Peabody was seated by the Council, representing Whetstone Valley District, and J. O. F. Kraushaar for the Aberdeen District. A quorum being present, the Council was called to order by the chairman, H. R. Kenaston.

Dr. Paddleford, of Miller, and Dr. McIntyre, of Bradley, were visitors.

E. W. Jones addressed the Council on Legislative Needs.

E. W. Jones presented communications from Mr. Harry J. Boyts, Live Stock Commissioner. A resolution of the Sioux City Live Stock Sanitary Board was presented. This resolution was approved as a proper activity for South Dakota. The eradication of tuberculous cattle in our state.

The Council directed that E. W. Jones, H. R. Kenaston and Secretary Cook draft such a resolution.

RESOLUTION: "With the United States Department of Agriculture and dairy interests considering a plan to reduce the cattle population and dairy production, we believe it is in keeping with the present livestock program to cull out the tuberculous cattle in South Dakota and other untested areas first. Drought, grasshoppers and financial conditions have made it impossible for South Dakota to pay its share of indemnities to carry on the program of tuberculosis eradication, and now untested areas are facing a disadvantage in marketing live stock and dairy products. To remove the reactor cattle to the tuberculin test is a sound practice, as the Bureau of Animal Industry has demonstrated so well in the past ten (10) years.

The government has established a fee loan office at Pierre, S. Dak., where loans will be made to farmers to purchase feed for foundation herds. These herds should be tested before loans are made. It is unsafe to loan money on untested herds.

The total indemnity for reactors should be paid by the government in all testing in South Dakota, for the state is financially unable to pay its share of the expense. Such assistance would make it possible to test most of the eastern part of the state this fall and winter. There are sufficient accredited veterinarians in practice in the state to do the work. While the surplus would be reduced by removing tuberculous cattle, the foundation animals preserved in the herds would place the live stock industry of the state on a sounder basis for economical production."

E. W. Jones, President
H. R. Kenaston, Chairman Council
J. F. D. Cook, Secretary

The subject of a minimum schedule of fees for guidance for professional services was next considered. This minimum fee schedule for adequate medical services as required by Federal Rules and Regulations Bulletin No. 7, was outlined and adopted. The fee schedule followed the schedule which has been in operation for some twenty years. With due consideration to the addition of newer diagnostic procedures. The fee schedule for professional services as adopted to be presented to the State Federal Emergency Relief Administrator, Hon. W. L. Eales, of Pierre, S. Dak., as soon as the secretary may arrange for a conference.

Motion made and carried that the chairman appoint a committee to contact State Federal Administrator Hon. W. L. Eales, at Pierre, S. Dak., and present the schedule of fees as adopted.

That this committee be permanent as required

by the Federal Administrator in Federal Emergency Relief Bulletin No. 7.

This fee schedule to be a confidential report.

Chairman Kenaston appointed the following: E. W. Jones, P. D. Peabody, A. S. Rider, J. O. F. Kraushaar and J. F. D. Cook, secretary.

P. D. Peabody called attention to the necessity of the hospitals of the state adopting a uniform schedule for the care of the indigent. After careful consideration on motion regularly presented and having received a unanimous yea vote. Viz.:

"The State Medical Association recommends that a meeting be called of the South Dakota Hospital Association to consider a standardized fee schedule for the care of the indigent. Anticipating co-operation with local and State Federal Emergency Relief Administrators."

The Council directed the secretary to send a copy of this resolution to the South Dakota Hospital Association officers.

Motion by P. D. Peabody duly seconded, that the Medical Defense Committee be directed to study the various malpractice suits of our members; making a survey of the attitude of the medical men giving consolation and aid to the prosecution in these cases.

To evaluate and make recommendations to the Council in malpractice suits.

By phone your secretary made appointment with State Federal Relief Administrator Hon. W. L. Eales, of Pierre, S. Dak., for Tuesday p. m., October 17, 1933.

Respectfully submitted,

J. F. D. Cook,
Secretary.

To Hon. W. L. Eales:

Medical Service Under Federal and State Emergency Relief

The medical profession has cared for the indigent sick and semi-indigent sick for so long that the matter has become a tradition. The public has come to look to the medical profession for this sort of service without any sort of remuneration. This is clearly an imposition. Many of those in authority seem to have overlooked the very patent fact that the medical profession as a group requires relief in about the same proportion that other groups require it. It is not contemplated or expected, that anything will be given to the medical profession, any more and the same character of relief is to be extended to other professional and business groups; but by the same token it is not contemplated that other professional and business groups shall contribute to the relief program any more than their share as individual citizens. It would seem logical, therefore, to expect the physician to render as much free service as a citizen as any other individual, and that he receive compensation for his professional services at least on a par with the compensation given other professional and business groups for their service and merchandise. Certainly, the physician should be compensated for his efforts in determining by physical examination who among those receiving this emergency relief may be required to work, and what sort of work they shall do. There is distinctly a difference between such medical care as is necessary to mitigate suffering and save life and that which determines the condition under which the individual will receive relief from the Government.

The "Rules and Regulations Governing Medical Care Provided in the Home to Recipients of Unemployment Relief," the same being Bulletin No. 7 of the Federal Emergency Relief Administration at Washington. According to this pronouncement, it is contemplated that medical service rendered recipients of unemployment relief, in which the federal government participates, in their homes, be paid for, albeit on a reduced fee basis, presumably such fees as might be expected from patients in the lower financial bracket. It will be noted, particularly, that in administering this relief, it is contemplated that the government will deal only with the organized medical, dental and nursing professions, which would seem to place an obligation upon these groups hard to evade.

Whereas, federal, state and local governments are co-operating in the laudable endeavor of relieving want and suffering among our people, and

Whereas, health and sickness constitute prime factors in the situtation, and

Whereas, the medical profession is traditionally held responsible for the care of the indigent sick, therefore be it

Resolved, that the Council of the South Dakota State Medical Association, properly and constitutionally acting for the medical profession of South Dakota ad interim, announces the following policy in this connection.

1. The medical profession of South Dakota, as represented by the State Medical Association, earnestly and sincerely applauds the efforts of federal, state and local governments toward relieving the distress of our indigent citizens, and offers reservedly to do its part, collectively and individually as citizens.

2. It is recognized, however, that indigency comprises not alone the absence of funds with

which to buy the necessities of life, but the existence of disease and the absence of health as well, thus comprising a vicious cycle that it is now desired to disrupt. It would seem that restoration of health, prevention of disease and the prevention of the suffering incident to disease, are as much the burden of the relief agencies co-operating in this movement as the extension of funds for the purchase of food and clothing, and that in supplying these unquestionably basic requirements, the burden should be upon the whole people and not upon the medical profession as a group. In view of this conclusion, the medical profession, while it is willing to bear its share of the burden, respectfully insists that in the administration of this relief, provisions be made for the remuneration of those legally engaged in the practice of medicine, of whatsoever group, at least in part, for their services, on a basis fairly comparative with the relief extends along other lines.

3. In view of the fact that the Rules and Regulations Governing Medical Care Provided in the Home to Recipients of Unemployment Relief recently promulgated by the Federal Emergency Relief Administration, at Washington, contemplates that "medicine, medical supplies and all medical attendance," be paid for and establishing it as a uniform policy that the provisions for medical, nursing and dental care of indigent persons be through agreements between relief administration forces and the organized medical, nursing and dental professions, state and local, constituent county medical societies will arrange with local relief administrators for the extension of medical relief upon an agreed basis of remuneration.

4. In view of the fact that relief agencies under this movement are treading upon ground made sacred by the sacrifices of the medical profession through many generations, and is assuming a portion of the burden of medical service in this connection, it is deemed fair that service be rendered when and if this form of relief is paid for through the medium of fees rather than whole time employment.

5. The State Medical Association stands ready to agree with federal and state administrators of this relief, upon a uniform schedule of fees, for communities in the state similarly situated as to the cost of medical service, the same to be recommended to county medical societies as a basis for their contracts with the Relief Administration.

Preamble

In accepting this opportunity to co-operate with the Emergency Relief Administration, the medical profession acknowledges its responsibility first and foremost to provide the best possible medical care to the indigent poor of South Dakota; and, secondly, to the profession itself to promote and safeguard its interests.

Several broad principles may be enumerated:

(1) The medical association enters into this plan for the period of the emergency only and it shall have the power to designate when the emergency is over.

(2) The control of the administration of the medical relief shall reside with the Association through its designated state committees.

(3) The present and future policies shall be subject to the approval of the Association.

(4) The reservation of the personal relationship between the doctor and the patient shall be paramount.

(5) The fee schedule in general shall be on a basis of customary fees with 15 per cent discount.

(6) The payment of fees shall be arranged on as simple and easy a basis as possible to facilitate collection by the doctors.

(7) It shall be agreed that medical relief shall be supplied by the individual physicians, preferably by the patient's own or previous physician and shall insure free choice of physician by the client.

(8) It shall not be the policy to develop and centralize medical care in the hospitals or clinics except in so far as special diagnostic and treatment aids are needed.

(9) The E. R. A. shall not pay physicians for work in clinics; nor shall it pay hospitals for admission clinic charges.

(10) Problems will arise in some districts requiring special recognition and treatment.

It is recognized that there are grave dangers inherent in this plan, such as the development of a bureaucracy both in the medical organization and the E. R. A.; that favoritism to certain physicians may develop; that unethical practices must be watched.

The designation of who shall receive medical relief as provided by the E. R. A. is primarily for the E. R. A. to decide. However, the Medical Relief Committee of the State may make suggestions.

That the medical association enter into this plan for the emergency only.

Organization

The organization of Medical Relief shall be as follows:

A Medical Relief Committee to be known as the Medical Relief Committee of the State Association shall be organized and assigned the following duties:

(1) To formulate policies and plans in co-operation with the E. R. A.

(2) To carry on a close liaison with the E. R. A.

(3) To organize a subcommittee in each District to be known as the Medical Relief Committee of the District, one man from each county in the District.

(4) To act on all complaints or requests from either the E. R. A. or the district committees.

(5) To gather as accurate reports as possible of the work in each district.

(6) The district councilor on the committee shall act as organizer and supervisor of the work in the counties in his district.

Medical Relief Committee of the District Medical Society

(1) Shall be appionted in each district medical society.

(2) Shall organize to supervise the work in each district in co-operation with the District and County Relief Administration.

(3) Shall maintain at all times direct control over the Medical Relief.

(4) Shall have power of approval of adjustment of bills, such as those objected to by the E. R. A. as being exorbitant, false or technically incorrect.

(5) Shall have frequent contact with the E. R. A.

(6) Shall secure monthly reports of the amount of work done, bills presented, bills paid, doctors receiving payments and amounts, and any other pertinent information.

(7) Shall be zealous to provide the best medical care—co-operate with other health organizations.

Note to the Officers of the District Societies

To the Presidents and Secretaries of the District Medical Societies:

The Medical Relief Committee of the State Association submits herewith a memorandum of a temporary agreement entered into with the State Emergency Relief Administration which outlines the practices to be observed in taking care of Emergency Relief clients.

In reading this plan you will observe that we have agreed to set up in each district a Medical Committee to be known as the Medical Relief Advisory Committee of the district to co-operate with the District and County Director in order that the principles set forth in this plan may be started into operation.

The Committee, therefore, requests you to take the following immediate steps:

(1) The District Society shall appoint or elect a committee of one member from each county in the district to be known as the District Medical Relief Advisory Committee.

(2) This committee shall immediately prepare for submission to the District and County Director a list of licensed physicians within the district who are willing to accept Emergency Relief cases.

(3) The committee shall contact the District and County Directors of Emergency Relief clients.

Several parts of the plan are worthy of special attention:

The doctors shall strive to take care of the clients in the home and shall only refer them to the hospital for emergency conditions.

The method of submitting bills should be carefully studied and it should be noted that no cases shall be charged to the Emergency Relief Administration unless properly authorized.

The committee stands ready to assist in any way possible to help in organizing or to smooth out troubles which may arise. We have promised the Emergency Relief Administration the wholehearted co-operation of the profession.

Study Rules and Regulations No. 7, September 23rd issue of the Journal of the American Medical Association page 1026.

State Committee of South Dakota State Medical Association

E. W. Jones, President
A. R. Rider
J. O. F. Kraushaar
P. D. Peabody
J. F. D. Cook, Secretary

Huron, South Dakota, October 12, 1933.

Council Meeting On Federal Emergency Relief

Pierre, S. Dak., October 17, 1933.

Your Committee on Federal Emergency Relief to the Recipients of Unemployment Relief Governing Medical Care Provided in the Home.

By appointment for 2:00 P. M., October 17th, met at the office of Hon. W. L. Eales, State Federal Administrator, and presented a fee schedule "Governing Medical Care in the Home to Recipients of Unemployment Relief," as outlined in Rules and Regulations No. 7 of the Federal Government; an outline of the Associations plan for co-operation.

We were graciously received. The minimum fee schedule was presented on the basis of a 15 per cent reduction. The same percentage salary reduction required by the Government of all Federal Employees. Mr. Eales approved temporarily, this schedule, until such time as he may be able to give the same further study.

Your Committee contacted Hon. C. A. Russell, Secretary of Agriculture, South Dakota. Presenting for his consideration the Resolution which was submitted to the Hon. Henry Wallace, Secretary of Agriculture, Washington, D. C., as directed by the Council of October 12, 1933.

Respectfully submitted,

E. W. Jones, President
A. S. Rider
J. O. F. Kraushaar
J. F. D. Cook, Secretary

Council Meeting

Huron, S. Dak., December 1, 1933.

The Council met as per call of President E. W. Jones.

Roll call. Officers and Councilors present: E. W. Jones, W. G. Magee, A. S. Rider, M. J. Hammond, C. E. Sherwood, B. M. Hart, J. C. Shirley, N. J. Nessa, S. M. Hohf, J. R. Westaby, Chas. Flett, J. F. D. Cook, Secretary. Secretary called a quorum present.

Meeting called to order by E. W. Jones, President.

A letter to Secretary Cook from Chairman of the Council, H. R. Kenaston, was presented by the Secretary. Dr. Kenaston was in Sioux City and unable to be present.

A letter to Secretary from A. E. Bostrom announcing his location in Minneapolis and asking for a transfer car and his resignation as Councilor for Kingsbury County District.

On motion the resignation of A. E. Bostrom be accepted and N. K. Hopkins of Arlington, S. Dak., be elected to the vacancy.

Motion carried.

E. W. Jones presented the status of action of the Committee delegated to contact Hon. W. L. Eales. A free discussion of the correspondence was had.

Motion by S. M. Hohf, supported by B. M. Hart and J. R. Westaby, that the Committee report be accepted; that the Committee be continued; that W. G. Magee be added to Committee. Said Committee to consider the fee schedule of the State Commission; if not acceptable to contact Hon. W. L. Eales at his office in Pierre, South Dakota. Carried.

J. R. Westaby moved that any reduction by State Administrator on fee schedule adopted October 12th, 1933 by Council, below 50 per cent will be considered as unsatisfactory and not equitable.

Seconded by S. M. Hohf. On vote duly carried.

The Council directed Secretary Cook to call while in session, by phone, W. L. Eales at Pierre for information and asking for a conference for the Committee. I immediately contacted W. L. Eales by phone asking for a conference. This request was denied by W. L. Eales who stated that his plans were being made up that day and would be in our hands by Saturday or Sunday.

Council, on motion, directed the Committee to meet at Madison, December 7, 1933 at 5:00 P. M. to consider material eminating from the office of Hon. W. L. Eales, Emergency Relief Administrator.

On motion S. M. Hohf, and duly seconded, "That the material mailed to members of the profession under date of November 10, by Secretary Cook is hereby approved."

Carried.

Respectfully submitted,

J. F. D Cook, Secretary

Council Committee On Federal Emergency Relief

Madison, S. Dak., December 7, 1933.

Committee met at the office of J. R. Westaby.

Following members were present: E. W. Jones, W. G. Magee, M. J. Hammond, N. J. Nessa, A. S. Rider, N. K. Hopkins, J. R. Westaby and J. F. D. Cook.

The Committee took under consideration the correspondence eminating from the State Emergency Committee my Hon. W. L. Eales, State Administrator.

The mimeographed circular letter dated Pierre, S. Dak., Dec. 2, 1933, to County Relief Administrator in which was set forth Rules and Regulations and a schedule of fees to be allowed for Medical and Surgical Care to those receiving Federal Emergency Relief, was considered.

The Administrator failed to officially notify the Association of his adoption of a fee schedule, directing same to County Relief Directors.

The Association Committee, December 1st by phone, asked for a conference to study the schedule. This request was denied by Mr. Eales.

The Committee of Council of the State Association having made the approach as directed in F. E. R. Rules and Regulations No. 7, and our offer of co-operation made October 17, 1933, so far has been ignored.

The Committee does not approve of the schedule as promulgated by the Emergency Committee, as it does not provide for adequate Medical Care, as outlined in F. E. R. No. 7.

Respectfully submitted

J. F. D. Cook, Secretary

Dr. Kenaston: Are there any additions or corrections to these minutes?

Dr. S. M. Hohf: I think it would be well to state that you immediately contacted Mr. Eales by phone at the Huron meeting, Dec. 1, 1933.

Dr. Kenaston: If there are no further corrections or additions the minutes stand approved as read.

Dr. Cook then read the Report of Membership and Finance.

From this report it is evident that there is work to be done by the District Medical Societies in procuring members. According to the By-Laws of the State Medical Association, the District Medical Society is the Door for membership to the State and American Medical Associations. That the District Society is the sole judge of its membership. This fact of the District Society being the entrance to membership in organized medicine, it is encumbent on the District Societies to campaign for membership in their respective Districts.

You will notice from the following report of membership by districts, that each district has added from 1 to 8 new members. The Black Hills District holds the banner for membership, 48 members paid up with eight new members. Evidently "Gold in Them Thar Hills" may have had something to do with the increase in membership. Perhaps the officers of the District have made a membership campaign of the District. Each district should contact new men in their district for membership. It has been noted in the Journal-Lancet that the Black Hills Medical Society in honoring a lady with the Presidency of their Medical Society was the first to do so in the State. To be correct Sioux Falls and Yankton Societies have so honored lady members. The State Medical Association is proud of its lady physicians, who have given loyal support to local and state programs of the Association.

(See page 411, 7 P. M. Session, May 14, for Financial Statement and Report.)

Dr. Kenaston appointed E. A. Pittenger and C. E. Sherwood as an auditing committee to go over the financial statement and report.

Committee Report on Scientific Program

Dr. Cook: I presume the printed Scientific Program is the only report the Committee have to make. Ask Dr. Jones for a supplemental report.

Dr. Jones: I have nothing to suggest except that I want to commend the co-operation of the Mitchell physicians in working hard and long and steady to present an excellent program, in getting up their clinics and presenting cases that the men desired. I might say that they have a wonderful clinic in the way of material to present in the next two days. They are using one history form for all clinics, and no one is supposed to bring a man or case into the clinic unless he has a complete history of the entire case. I might add that for the lectures of Dr. Harrington of Rochester on cancer of the breast, and of Dr. Heunekens on the care of the infant in the first year of his life, we had an excess of seats of 350 over what we would need for the medical association, so we have issued tickets to be issued to the parent teachers' association for these two lectures.

Committee on Public Policies and Legislation, relative to this I want to read a letter from Dr. Woodward, calling attention to certain bills which have been introduced, the first Proposed Uniform Narcotic Drug Act; A Caustic Poison Act and a Medical Lien Act. I have here the proposed measures for the Committee's consideration.

Dr. B. A. Bobb moved that these be laid on the table for further discussion.

Dr. Hohf: Seconded. On motion carried.

Discussion was had of the meeting called by the Governor Tom Berry of members of the Medical Association to discuss medical relief and also the reasons for such meeting.

Dr. Jones stated that he advised the Governor's representative that a resolution would go down from this Society to the President of the United States and Harry L Hopkins, condemning the action of the State Relief department on medical relief matters.

A short discussion was had regarding compensation for injuries received while on C. W. A. and Relief work.

Dr. Maley was then introduced by Dr. Jones and gave a talk regarding the work in the relief office applying to medical care and hospitalization for indigents. Dr. Maley also answered questions asked by various Doctors regarding relief administration.

He stated he had never had an opportunity to examine Bulletin No. 7 of the United States Relief Administration setting forth rules and regulations for the administration of medical care and hospitalization of indigents until that day, that a great many rules and regulations had been

laid down by the relief administration at Pierre, which apparently didn't take into account this Bulletin at all. That he had a hard time getting any information at Pierre as to just what the rules and regulations were governing these things. That he had only been in his present office passing on medical and hospital bills for about eight weeks.

Dr. Jones asked Dr. Maley to procure a list of the physicians who had been invited to come to the Pierre conference, for there might be a number of Doctors in attendance at this convention that had received letters at home, but who would get their mail too late to attend. Dr. Maley promised to get that information to Dr. Cook sometime Tuesday or Wednesday, before the meeting adjourned.

Dr. Jones: It being 6:00 o'clock I move that we adjourn temporarily until after the meeting of the House of Delegates, and re-convene here later and then formulate some plan for presenting our views to the Governor. Motion carried.

Tuesday, May 14, 1934, 10:00 P. M.

Dr. Maley discussed further the Federal Rules and Regulations No. 7 for the administration of medical relief, and stated that the medical men had carried out their part by appointing the committee to work with the relief director. He stated that his idea was to revoke every rule and regulation made at Pierre, and take this Rule No. 7, and work under that, and have some of the matters contained in it clarified by the medical committee.

A general discussion was had regarding relief problems and also the question of compensation for injuries while on relief work.

Dr. Cook read a letter from a past-President of the Association, Dr. F. E. Clough, now located at San Bernadino, California.

Dr. Cottam then made the announcement of the terms for subscriptions to the JOURNAL LANCET for the coming year. He stated that while the Journal had reduced the rate last year and were willing to do so again for the coming year, in view of existing conditions, at the same time with the increased cost of paper and the reduction of advertising, the Journal had really been going behind, even while keeping up the standard of the publication in every way. They feel that in view of their liberal terms they would like if possible to have a little more permanent arrangement than a year to year arrangement, and though perhaps the Association would be willing to go on record as agreeing to continue the present rate of $1.00 for the ensueing year, and then increase it to $1.50 the next year, and then to the former rate of $2.00 for the next three years. They would look on this more as an expression of confidence in them.

Dr. Bobb: I believe that is a fair proposition and I move we accept such a proposition as Dr. Cottam has put up to us.

Dr. Rider: Second the motion.

Dr. Pittenger: This is accepted with the understanding that if conditions have not improved, it can be modified. Accepted by maker and supporter of motion.

Dr. Cottam: The Journal has always been fair and I think you will find them to continue to be fair in that respect.

Dr. Kenaston: All in favor of the motion as stated, with Dr. Pittenger's addition, signify by the usual sign. Contrary the same. Motion carried.

Dr. Kenaston: What do you wish to do about the floral tribute for Mrs. R. D. Jennings of Hot Springs, S. Dak., the first organizer of the Woman's Auxiliary?

Dr. Pittenger: I move that a floral tribute be sent to Mrs. R. D. Jennings, and it be left to the discretion of the President and Secretary to select the same.

Dr. Jones: Second the motion.

Dr. Kenaston: You have heard the motion, all in favor signify by the usual sign. Contrary. Motion carried.

Dr. Jones: I think we should have a committee appointed to draft the resolutions regarding the State Relief Department.

Dr. Kenaston: I will appoint Dr. Jones, Dr. Magee, Dr. Rider and Dr. Cook.

Moved and seconded that we adjourn. Carried.

Minutes of the Council Meeting of the South Dakota State Medical Association in Fifty-third Annual Session—Mitchell, South Dakota

Tuesday, May 15, 1934

Meeting called by President E. W. Jones, to consider a letter directed, by Governor Thomas Berry, to several members of the Council and also to a list of physicians, twenty-seven in number, calling a conference at Pierre, Thursday, May 17, 1934.

The Council and members of the Governors committee noted in the daily paper that the Governor Thomas Berry was called to Washington, D. C. for a conference. It was deemed advisable to call the Governor's Secretary. By phone E. W. Jones called Pierre and was unable to contact the Governor's Secretary, however, Mrs. Berry

was contacted by phone, who informed Dr. Jones that the Governor was on his way to Washington, and did not know just when he would return.

J. C. Shirley moved, supported by W. A. Bates, "That resolutions be forwarded to President F. D. Roosevelt and H. L. Hopkins, if after seven days, following the Governors return to Pierre, S. Dak., the Governor Thomas Berry fails to call a conference of his committee of the medical profession, as he had planned for Thursday, Mary 17."

The motion on vote was duly carried.

Meeting adjourned.

Respectfully submitted,

J. F. D. Cook, M.D.
Secretary-Treasurer

MINUTES OF COUNCIL MEETING

South Dakota State Medical Association in Fifty-third Annual Session—Mitchell, South Dakota

May 16, 1934, Widmann Hotel—12:15 P. M.

Meeting called to order by Dr. H. R. Kenaston.

Roll call. Quorum present.

Dr. S. M. Hohf moved that the committee which had been previously appointed by Council be authorized to draft a resolution along the lines suggested at the end of the period mentioned, which is approximately a week after the Governor's return, to be presented, if need be, to President F. D. Roosevelt, Harry L. Hopkins and Governor Thomas Berry.

Motion seconded by N. K. Hopkins. Motion carried.

Dr. Jones: You are referring to the permanent committee, Dr. Hohf, that was appointed sometime ago by the Council to make contact with the relief department in the matter of medical relief.

Dr. Hohf: Yes, the Committee composed of W. G. Magee, E. W. Jones, A. S. Rider, J. O. F. Kraushaar, P. D. Peabody, J. F. D. Cook.

Dr. Kenaston: You have heard the motion, all in favor signify by the usual sign. Contrary. Motion is carried.

Dr. Cook: As directed by the President E. W. Jones, to contact the Governor's Secretary, Mr. Robertson, by phone and find out whether they planned to go ahead with the conference on Thursday. I talked to him over the telephone and he said that the conference would take place as scheduled, that he was delegated to represent the Governor and that Dr. Jenkins and Mr. Longrie would be the other two members of the Committee at this conference.

Dr. E. W. Jones: Moved that letter be addressed to the Governor's Secretary suggesting that before final action is taken with regard to the medical relief situation, it is respectfully requested that the Governor meet the Council of the South Dakota State Medical Association in Pierre, as soon as possible after his return to the State together with any additional practicing physicians in the State as he may choose, in addition to the above named executive body.

Dr. S. M. Hohf: Second the motion. Carried.

Letter directed as follows:

May 18, 1934

Secretary Governor Thomas Berry
Pierre, South Dakota

Re: Telephone conversation Dr. Bates

Attention: Governor Thomas Berry
Pierre, South Dakota

In regular session at Mitchell, S. Dak., May 16, and as directed by the Council, the following is submitted:

"As Governor and Relief Administrator it is requested that before final action is taken in regard to the medical relief situation, as governed by Federal Rules and Regulations No. 7, that Governor Thomas Berry meet the Council of the South Dakota Medical Association at Pierre, South Dakota, together with any additional practicing physicians in the State he may choose, at his call as soon as possible after the Governor returns to Pierre."

Respectfully,

Council of the South Dakota State Medical Association

E. W. Jones, President
H. R. Kenaston, Chairman
J. F. D. Cook, M.D.
Secretary-Treasurer

Dr. A. S. Rider: I would like to suggest that we have someone, probably Dr. Bates, call the Governor's Secretary and inform him that there has been so much confusion on account of the Governor's leaving the State that we would like to have the meeting called off.

Dr. Cook: I move that the Council delegate Dr. W. A. Bates to contact the Governor's Secretary by telephone, stating that a letter will follow and asking him to postpone the meeting of M.D.'s for May 17, until the Governors' return to the State.

Dr. J. C. Shirley: Second the motion.

Dr. Kenaston: The motion to delegate Dr. Bates to call the Governor's office and have the meeting postponed. All in favor say aye. Contrary. The motion is carried.

Dr. Bates is instructed to immediately call the Governor's Secretary and report to this body.

Communications read from Olin West, Secretary American Medical Association, and correspondence American College of Surgeons directed to them from Dr. H. J. Bartron regarding radio broadcasting from Luther Hospital, Watertown, South Dakota.

Dr. Cook stated as provided in By-Laws, it was necessary that such matters come before the local district society, that after the local society has duly considered the complaint in a judicial manner. Then if the action taken by the district society does not satisfy the complainant, he may appeal to the Council of the State Medical Association; if he is not satisfied with the action of the Council he may appeal to the Judicial Council of the A. M. A., who make recommendation to the House of Delegates of A. M. A. for their final action.

Dr. Magee made a statement of the circumstances at Watertown as to how the broadcasting was done and that he felt it was done in a fair manner, merely stating the condition of the patient, etc., for the information of the relative. He stated that he would make it a point presenting the matter before the district medical society for their consideration and action.

Dr. Cook: I move that this correspondence be referred to the Watertown District Society for their consideration by the Board of Censors.

Dr. Hohf: Second the motion.

Dr. Kenaston: You have heard the motion, all in favor signify by saying aye, contrary no. Motion is carried.

Dr. Bates: I have talked to the Secretary of Governor Berry and the meeting is postponed. I told him that the majority of these men on this Committee were members of the Association, and told him that he should call the Council for the meeting and any other physicians that he desired. He stated that the Governor, when he returned, might be here but a short time and the meeting would probably have to be called on a days notice.

Dr. Kenaston: Any further business.

Dr. S. M. Hohf: Election of a Secretary. In view of the fact that our present encumbent, while he is getting weary and tired of his job, he is becoming quite an expert, I have watched our encumbent from the first beginning of his office to the present time and he is getting better all the time. I, therefore, move you that our present secretary, Dr. J. F. D. Cook be re-elected Secretary of the South Dakota State Medical Association for the next three years.

Dr. M. J. Hammond: Second the motion.

Dr. Kenaston: You have heard the motion. All in favor say aye. Contrary no. The motion is carried. Dr. Cook is re-elected secretary.

Dr. Kenaston: The only thing left is auditing the books of the Secretary-Treasurer. They may make their audit and make their report at the next meeting of the Council in order not to keep the members away any longer from the Scientific Program.

Auditing Committee met with the Secretary-Treasurer, and on checking vouchers and ledgers found the same correct.

E. A. Pittenger
C. E. Sherwood

Motion to adjourn made and seconded. Carried.

J. F. D. Cook,
Secretary.

The President's Address*

E. W. Jones, M.D.
Mitchell, S. D.

THE Physicians are the only group in the United States who have sufficient knowledge, training and experience to practice medicine.

Absorbed entirely in their daily and nightly task of disease prevention and public health measures, healing the sick, and ministering to the afflicted, they have overlooked the fact that the octopus of big business has invaded this work. They have paid little attention to the extraordinary schemes for reorganizing their methods of practice proposed by Philanthropists, economists, sociologists, socialists, and over-ambitious public health officials. We can no longer overlook the problems created by this invasion.

The Practice of medicine is peculiarly the doctor's problem, and there can be no practice of medicine without Doctors of Medicine. This fact has been discovered, and realized very vividly by public health officials, and those without medical

*Read before the South Dakota State Medical Association, Mitchell, S. D., May 15, 1934.

training. Americans prefer to be human beings and not Soviets.

Hundreds of experiments are now in process in this country in the attempt to change the nature of medical practice. No individual, society, or Governmental body can question the right of the American citizen to pick his own Doctor, his own hospital, or pay his own bills with his own money. He is more interested in the quality of medical care, and not the plan of organization, nor the method of financing.

The Physicians of this country do not need the aid of foundations, socialistic bodies, philanthropic societies, bureaus and big business in caring for the sick, nor do they need the aid of the Government, except in the establishment of public health regulations, efficient laboratories and research bureaus, and only then, when under the direction of Physicians specially trained to supervise these activities.

For the sake of discussion let us examine some of the propaganda that has prompted some of these experiments. First, the majority report on the cost of medical care, a report that did not confine itself to the subject ostensibly under discussion, but developed into propaganda for state medicine.

The personnel of the committee, composed of some fifteen leaders (their self-styled designation) in the field of medicine, public health, and the social sciences, met to consider the problem of inefficient and insufficient medical service, the dissatisfaction of the public with the cost of such medical service, and of the medical profession with the average Physician's income and working conditions. (The problems also originated with the fifteen self-styled leaders.) During five years of work there were fifty-six members of this committee, less than one third of whom were engaged in the practice of medicine.

There were forty-eight members of the committee at the time the report was ready for publication; of the sixteen physicians then members of the committee, eight signed the minority report, rejecting the conclusions of the majority report, and pointed out the lack of integrity of the foundations upon which these conclusions were based.

The administrative staff consisted of Doctors of Philosophy to serve as directors of study, executive secretary, field secretary, associate director of study and statistician, respectively. Sixty-six other persons were listed as associated staff members. This list did not include those on a temporary basis.

A total of almost a million dollars was expended, twenty-seven published reports were issued before the final report was given to the waiting world. This final report was a very much distorted view of the questions they attempted to clarify, inasmuch as the studies published by the committee were too often those which threw the most favorable light upon the beliefs held by the Committee. And for each of these successful experiments, a score of unsuccessful ones might have been found.

Publicity staffs were organized and maintained to bring the recommendations of the committee to the attention of the general public, and the professions and agencies interested, and this propaganda assumed a critical attitude toward the medical profession, an attitude intentionally or unintentionally calculated to shake the confidence of the public in the integrity and ability of the physician. There was a veritable lack of unanimity among the majority members in presenting the report in that they pointed out that (1) "many persons do not receive medical service which is adequate, either in quantity or quality" (2) that one of the great problems in our present system is the difficulty the laity have in selecting a competent physician; yet in almost the same breath they urge that all, or practically all the physicians of a community, should be included in this ideal community center. (3) It is stated that the sliding scale of medical fees is one of the causes of dissatisfaction, since those of larger incomes feel that they are discriminated against when asked to pay a fee larger than the one collected from the poor patient. On the other hand, the committee points out that it is impossible for the smaller income group to pay for needed medical services, that the Physician must have a more adequate income, the public in general more satisfactory service, and suggests that the community supply the needed medical support through taxation. In other words, that the increased burden be shifted to the larger income group.

It is ridiculous to think that the committee had such childlike faith as to believe that the public considers the paying of a national medical bill through increased taxation. The inconsistency of the committee is absurd in that they are the protagonists of state medicine, and intend to force it down the neck of the medical profession, regardless of what the attitude of the profession may be; and yet they must depend on the physician's work to form the keystone of the committee's proposed "set-up." The point the committee missed entirely is that there can be no practice of medicine without practitioners of medicine; and their keynote has become, not the costs of medical care, but group practice under lay or state supervision.

Group practice, or the magic name of "Clinic," is a product of the twentieth century. Its appearance was heralded as that of a new era in medicine. The committee's report dwells in great length upon this "group practice," or clinic idea, points out to the Physician the advantages of having his time conserved, his overhead charges diminished, a large amount of equipment available, consultation with colleagues facilitated, vacations and opportunities for post-graduate study more readily provided, the net income higher and more stabilized, records more nearly complete, and research facilitated through the existence of a large number of records. Some of these advantages are undoubtedly real, others are found to be more apparent than real when the clinic idea is actually put into practice, or they are greatly outweighed by disadvantages which had not been taken into consideration when the group was organized as a clinic.

All of the expensive studies and investigations carried out by the committee have not disproved the fact, that 80 per cent of all the ailments for which people seek medical aid can be treated more cheaply and efficiently by the family physician with what he can carry in a hand bag. And the group or clinic has only reduced the cost of private practice about two per cent.

There are some two hundred clinics in the country. During late years many times this number have tried this experiment of group practice, and have given it up as an expensive experiment from a financial point of view, and from the loss of valuable friendships because of professional jealousies.

Group practice has no novelty, nor is it alluring. It is safe to assume that the committee holds that in group practice the Physician is answerable to the group and not to himself for the quality of his work. But they do not state the fact that the rendering of medical service depends upon the quality of the man rendering it, and not the fact that he belongs to "this group" or "that clinic." The group or clinic organizations strike at the very heart of the most important asset of American medicine, viz, the "physician-patient" relationship, and in this personal relationship the physician is answerable only to himself and to God for the quality of his work.

The American physicians have always striven to improve the quality of medical service, by raising the educational requirements, lengthening the course of medical intruction, providing desirable internships, and turning out well qualified general practitioners of medicine. All this work has been necessary because medicine is not an exact but growing science, and must keep abreast with civilization. This appeals to men with inquiring minds, who like people and want to serve them.

If we have to be mere cogs in a machine, such as the committee recommends, who do you think is going to suffer? The medical profession has honestly tried to raise its standards. Every law which has been passed regarding the requirements for license has not only been endorsed but has originated with the medical profession. But while raising our own standards the law makers have let down the bars to the cults, quacks, and nostrums, allowing men with a grade school education and with a few months of very unscientific training, to treat the sick. When we protest against such practices we are criticized and called a medical trust. If we don't protest we have failed in our duty to protect the health of the community, as well as an uninformed public.

The question of financing medical care is explained in Part III of the committee's report. This recommendation is that the cost of medical care be placed on a group payment basis, through the use of insurance, through the use of taxation, or through the use of both of these methods. This is not meant to preclude the continuation of medical service provided on an individual fee basis for those who prefer the present method. Cash benefits, i.e., compensation for wage-loss due to illness, if and when provided, should be separate and distinct from medical service.

The committee believes that since the cost of medical care falls very unevenly on different families in any one year, and on the same family in different years, that it is impossible to budget such costs accurately on an individual family basis; that for the low-income families, who constitute the great majority of the population present, expenditures are not only uneven and unpredictable, but also much too low in total to provide adequate medical service; that the population as a whole except in hard times, can, however, pay for adequate medical service without hardship. Various suggestions are made as to the methods for carrying out group payment for medical services.

The committee recommends that organized groups of consumers, such as industrial, fraternal, educational or other reasonable cohesive groups pay agreed annual sums in weekly or monthly payments into a common fund, arranging with organized clinics, hospital medical staffs, or community centers to furnish them or their families with virtually complete medical service. Some members of the committee believe that such insurance should be made obligatory for certain income groups, certain occupations, or certain areas.

It admits that certain groups cannot pay full cost of complete medical service, even on a peroidic basis, and believes that in these cases, such payments should be supplemented by community payment from a tax fund. In rural areas and those of low economic resources, the committee believes that Physicians should be subsidized, or employed on salaries to furnish general medical services to the residents of the community. The funds to finance this are to come from taxes, supplemented by state and Federal aid.

An examination of insurance methods that the committee would inaugurate has been tried many times, and with few exceptions has been found wanting. In spite of the extensive data available on the insurance systems of Europe and the evidence which can be procured to show that voluntary health insurance schemes have everywhere failed, the majority of the committee makes the definite recommendation that this country adopt the thoroughly discarded method of voluntary insurance. In the United States contract practice is essentially health insurance, and has already given rise to destructive competition among professional groups, inferior medical service, loss of personal relationship of patient and physician, and demoralization of the profession.

It is clear that all such schemes are contrary to sound public policy and that the shortest road to commercialization of the practice of medicine is through the supposedly rosy path of insurance. Proof of the evils of the compulsory health insurance system is at hand in our own experience in this country with the only compulsory system with which we have yet to deal, workmen's compensation insurance.

Under workmen's compensation, groups are soliciting contracts, often through paid lay promoters; laymen are organizing clinics and hiring doctors to do the work; standards of practice are being lowered; able physicians outside the group are being pushed to the wall; the patient is forced by his employer to go to a certain physician or clinic, and the physician is largely under the control of the insurance companies. This is a true picture of the Insurance practice, *do you want it?*

Under the heading of Medical Economics a joint meeting of the American Academy of Political and Social Science and the College of Physicians of Philadelphia was held recently. The program was planned originally to present the aspects of this topic from various points of view, not one physician was allowed to speak on the subject. The choice of essayists had been made deliberately with a view of overwhelming the medical profession. The choice of subjects was an attempt to stack the program against the medical profession by emphasizing the socialization of medical practice.

Here are some of the "learned" discussions by this Academy that calls itself "American."

One "Learned professor" of sociology pointed out that the public attitude toward medicine has changed, and he asserted that the large amount of medical care given the children in the schools, to the soldiers of the world war and to workers in industrial plants, and the increasing participation of the Government in medical practice has caused the public to look on medical service as they do on education and police protection. After this statement he immediately brought out the shortcomings of the profession, the resentment of the public, his pet hospital insurance scheme, and ended by stating that stubborness on the part of the profession will lead to violent reaction, and that a refusal to socialize medical service will ride the medical profession directly into state medicine.

The next speaker was the director of one of the few memorial funds in the United States. He attacked the right of medicine to control itself, and made the assertion that the medical profession considered itself "self sufficient" and that they tabooed all discussions of the subject. In general, he was opposed to our whole economic system, but particularly as it concerned medicine. He strongly advocated group payment, group practice, public regulation of prices, Government control and compulsory insurance on either a state wide or nation wide basis.

An officer of the Julius Rosenwald fund made an attack on the American Medical Association, including its officers, its house of Delegates, its trustees, its general manager, its editor, its bureau of economics and its publications. He lauded the majority report of the committee on costs of medical care, and emphasized the fact that many communities were organizing to care for the sick along the lines recommended by that report. He asserted that the plan of the Roosevelt Administration for medical care of the indigent is bad, in that it does not provide for the hospitals and the clinics, forgetting the fact that over 80 per cent of all medical ills can be cared for efficiently in the home, and finally he pointed out that the Milbank memorial fund, the Twentieth Century fund and the Julius Rosenwald fund are exceedingly active in organizing sickness insurance plans and aiding new projects for group hospitalization. He assailed the Journal of the American Medical Association for failing to endorse the British system. He accused the Secretary of the American Medical Association of misrepresenting an ad-

dress by Sir Henry Brackenbury in abstracting that address for the Bulletin of the American Medical Association. He then attacked a national medical officer for saying that "this agitation about the costs of medical care will all die down if we keep things quiet for a while," and he suggested that the public could take care of physicians and medical societies who express these principles, without much hesitation.

Isn't it interesting to notice how intensely the large "so called philanthropic and research funds" are interested in health insurance, when 42 per cent of every dollar remains with the promoters of the insurance. Why is it that they are so intent and present such an insidious program for State Medicine, health insurance and group practice, unless it is for selfish gain? JUDGE FOR YOURSELVES.

Without the cooperation of the medical profession, no system of medical practice can succeed. The indigent will always be with us, and the indigent will always get medical care. This fact is to the eternal credit of the medical profession.

The medical profession has long since recognized the right of the state to concern itself with preventive medicine, well conducted state laboratories, not in competition with private laboratories, and state regulations governing licensure of applicants to practice medicine. In the above plans medicine has given largely of its services to make for their success. The medical profession cannot stand for nationalization of property and socialization of personal service, when they say to the medical profession that unless it socializes itself, socialization will be forced upon it.

The organized medical profession is an intimate part of our nation and cannot be forced into any position. Some of our large funds for the study of socialistic problems are pledged to a program of socialization of medical care. They are not satisfied with our economic, political and social systems, but it is annoying to have them center their attention on medicine, and want to begin all the reorganization with the medical profession. They point with great pride and emphasis to what has been accomplished by other nations. You are all aware of what a "Fiasco" State medicine, health insurance, and hospital insurance was in England. Consider what happened in Germany when Hitler took over the reins. Contracts held by physicians with various sickness organizations, and the high standard of medical practice set up under a different reign, were treated as bits of paper. In their place, Hitler ordered the Government to license 5,000 naturopaths and told the medical profession of Germany to turn its face to the Naturopath system of practice.

And then Russia, with its Sovietized system of red medicine. The foundation committee made a 9,000 mile jaunt into Russia, spending a total of four weeks to study what red medicine had to offer. They published a review of their observations which brings to light the remarkable vagaries of their four weeks inspection tour. FAILURE is the one word that describes the activities of all forms of socialistic or state medicine, but the committee consoles itself by the statement that where others have failed with such systems Americans will be sure to succeed. It just brings out the fact, that as long as nations are subject to political manipulations, contracts between a nation and individuals of a nation are merely scraps of paper.

The only fact that systems of State and Socialized medicine has brought out throughout the world, is that not one of them has been an established success. Some interesting things have happened just lately. Hugh Cabot, who has visited extensively in foreign countries, very forcibly states that the standard of medical care in the United States is far superior to that of any foreign country. This is a significant statement to come from Dr. Cabot, as he was once a staunch supporter of social insurance and state medicine.

It is extremely interesting to note England's fear that its system of compulsory health insurance would bankrupt the nation, as it has already bankrupted the voluntary hospitals, and the politicians offered as a cure for the situation more social insurance.

While writing this paper I picked up the Literary Digest, dated March 31, 1934, and read with interest and amazement an orphan article entitled "The Group Hospitalization Idea Gains Favor." It is very similar to the many articles that have been published in the lay press supporting the insidious program for State Medicine. It is undoubtedly part of the publicity program of the committee on the costs of medical care.

As the Title suggests, it deals entirely with hospital insurance plans, and points with great pride to the fact that more than one hundred hospitals in about forty different cities are at present taking part in these plans, and that thirty cities in twenty-one states have started group hospitalization in the past twelve months. It quotes the American Hospital Association as authority for the statement, that several other states will have similar plans as soon as local organizations have been completed or legal difficulties cleared out of the way.

It points with great pride to the voluntary insurance plan of England, that has been in force for the past ten years, and falsely states that it is a grand success and is growing every day. Quite different from the report referred to elsewhere in this paper. It also states that the plan is quite simple, in that each subscriber pays from five to twelve dollars per year, which usually but not always, guarantees him twenty-one days hospitalization in a ward bed, and no extra charges added.

It states further that hospital care is needed by one person in twelve each year, so here are the figures; one hundred and forty-four dollars are paid the insurance company to partially guarantee twenty-one hospital days in a ward that can be purchased in any hospital in South Dakota for sixty-three dollars or less, and add twenty-five dollars for accessories, such as x-ray, laboratory, operating room, and the usual hospital dressings, and you have a total of eighty-eight dollars, leaving a balance of fifty-six dollars for the insurance company. Is there any wonder that the so-called "large funds" and "big business" are trying to force group and hospital insurance upon the Medical profession and the people?

The article states that among hospital organizations the voluntary insurance plan has met with a rousing welcome and quotes the American Hospital Association as having endorsed the scheme a year ago. Another supporter of the plan is the United Hospital Fund in New York City. The Commissioner of Hospitals in New York City, as well as the President of the American Hospital Association are stated to be influential supporters of the plan. The loyalty and sincerity of men high up in hospital organization must be questioned. Surely they are not so child-minded as to think Hospitals can succeed without practitioners of medicine. The leaders in the medical profession, as well as the influential medical organizations, should take heed and combat such nefarious articles in the lay-periodicals by publishing articles setting forth the truth in the same magazines.

One needs but read an article in the Journal of American Medical Association under date of March 24, 1934, to see what the results would be from such Insurance. The majority of the American Physicians have not been greatly concerned about the entrance of the state into medical practice, and the people in general, even less concerned.

The well established functions of health departments have been, and should be, the prevention of disease, by the control of the water supply and of the food supply; the disposal of sewage and the control of epidemics, all in cooperation with the medical profession. But when money was freely available in our state, and in many other states, they encroached on the province of the medical profession by conducting periodic health examinations, tubercular clinics and children's clinics at various points in the state, and particularly at the State Fair. When the budget was lowered they immediately reverted back to their original functions of a health department, allowing the physicians to carry on the work they so readily assumed was their own.

It would be useless to attempt to repeat the phases of Government participation in medical care through the agency of the Veterans' Bureau. It is a long story of how the Veterans, through political activity, obtained for themselves, not only cash compensation, but the right to complete medical and surgical care, regardless of the relationship of their ailments to the government service. However, again when the depression arrived, the Government was able to see the folly of giving complete medical and surgical care to the veterans who were able to pay for such care, when the illness or disability bore no relationship to the Government service.

And again the medical profession was called upon to care for the men the politicians so carefully nursed when money was plentiful, and votes were needed. It is only a short matter of time until the politicians will need a large number of votes and they will naturally turn to the ex-service men, and provide them with all the promises and prepaid services that it is possible to obtain from the tax-paying public. *Politics and sincerity are rarely partners.*

And now comes the present administration, with all the various methods for overcoming the depression that you are all more or less familiar with, and in all these efforts the medical profession has participated in fully realizing the existence of the emergency. The medical profession has "carried on" and has done "its bit" without the fanfare of trumpets or the flooding of the "lay press" with editorial articles, such as has accompanied the majority report of the committee on the costs of medical care.

The entire program has been in itself an insidious propaganda for state medicine among those who have received the benefits, but it has been of some value to many of our almost indigent Physicians. And again to the eternal credit of the medical profession, it has been lending itself to many experiments in medical care, such as contract practice, lodge practice, industrial practice, hospital insurance schemes, University practice and group practice, as such experiments could not

exist without some of the medical profession. The scientific measurement of the results of the above experiments has been waived or overlooked by the committee, but it is quite safe to say that the morbidity and mortality rates are not lowered any by this experimentation. At present mortality and morbidity rates in the United States are much lower than most of those of civilized countries.

We are working under the "New Deal" at present, and just how far this evolutionary experiment will reach is rather beside the point, for until such a time as something more tangible is developed, we must accept it. Its revolutionary characteristics affect every individual in every walk of life, every business and professional man, every organization regardless of its nature or function. The medical profession has felt rather independent and has assumed a false sense of security because we have been exempted from the regulations of the N.R.A. and C.W.A. Some eminent medical authorities believe we are only on probation, and that Federal regulation of medical practice and complete socialization of our profession is just "around the corner."

An extreme effort is being put forth to revive a failing economic system. The adoption of codes by every branch of business and industry has become a national practice. The destruction of countless numbers of our domestic animals, the forced idleness of our fertile lands, the forced idleness of our productive classes by declaring shorter hours, days, and weeks, to curb over-production, and bring about a more intimate relationship of supply and demand is certainly a revolutionary action. The old economic system of capitalistic, competitive or individualistic effort has not worked perfectly, yet it has brought more relief to the masses than any system which has been tried elsewhere in the world, and unstable conditions in industry, commerce, and so forth are replacing competitive effort by collective effort. Hence, it is necessary to replace competitive effort by Codes of conduct, that must limit activities of American producers and American business organizations.

460 years before Christ was born, a great thinker outlined his ideals for the practice of the healing art. No other profession, science, or industry has ever been organized on a code of conduct. The great Hippocratic Code need not be altered, because it was not founded on the basis of competitive gain. The tragedies which have occurred in industry, public utilities, banking, and so on, have not taken place in medical practice, and will never take place as long as the Hippocratic Code governs our activities.

The profession need not fear that the supply of health will ever be disproportionate to the demand, and at this time, about the only tangible asset South Dakota people have is good health. The market will never be flooded with such wares.

During the last quarter of a century you have seen the rise of the business genius, the controlling industrialist, the great financiers, and the advent of millions of automobiles, radios and electric refrigerators, all of which have played a very important part in raising the level of living of the average man to heights hitherto undreamed of. Then, something happened that required economic adjustments, and the confusion rendered these business giants and outstanding leaders helpless.

Now, what did happen to the medical profession during all this confusion, and this collapse? Nothing, as they simply and steadily carried on with their great code, and this thought might be suggested and applied to business.

A "mushroom" growth of economists has been uncovered and each one has his own theory for a cure of our business ills, and he pushes his own pet idea with God given energy, as the way out of our dilemma. Industries, businesses and professions are being dragged up to the court of justice and subjected to a fire of criticism and investigation. History teaches us that in every cycle of depression this is a pet pastime of economists, and there have been many, and with each period of depression we have emerged on top, and have been better citizens for this experience.

The medical profession has not escaped this criticism. These benefactors of the human race have created the opportunity and have enlisted the aid of some of the large philanthropic and research funds in trying to tear down the traditions of a great profession that has been operating under a code for the last 2,300 years. Their entering wedge was the much publicized report on the "costs of medical care." They have taken advantage of a serious economic situation to exploit their self-styled superior knowledge of what a sick man should have in the way of medical care, when he can't get enough of the "world's goods" to keep his body and soul together, purposely ignoring the fact that due to the unselfish scientific minds of the medical profession, no one has suffered or died for lack of adequate medical care. This fact is very evident by the low death rate in the United States. Physicians, as a class, are usually poor business men, and many have squandered their savings in unwise investments, and in

the past have received from the learned banker and business man very little sympathy for this display of ignorance. In the past few years they have witnessed the savings of bankers and business men vanish in unwise investments, largely due to their failure to recognize and heed the diagnostic signs before the disease became incurable. Physicians have always been more concerned with human, rather than financial investments. Most medical men devote at least one half of their entire time to the unremunerative care of the poor, and only a part of their time for their own financial benefit.

Perhaps business men will think this over and adopt some code for themselves, for sharing with others is the corner stone of the New Deal.

The general Practioner of medicine occupies a very important position in the medical world today. In him lies the power to prevent the adoption of state or bureaucratic medicine. The all important physician-patient relationship, a relationship so vitally necessary if we follow our centuries-old code, can only be maintained by the family doctor. He has never been so competent to treat disease as he is today. He has always been more concerned with human values than with financial ones. His devotion to his professional duties, his high ideal of honesty and integrity, and confidence the public has in him, together with his simple philosophy has won for him a place in our civilization that cannot be filled by our learned economists, our big business men, our international bankers, and even our ecclesiastics.

Radical changes have occurred in the work of the general practitioner, tending to undermine his individualistic work, by the introduction of team work or group medicine, call it collectivism if you like, as being a more progressive way to care for the sick. There is danger that he may become the "forgotten man". This group work in some communities has centered around a hospital and has been called hospital groups or clinics. It has the tendency to produce a more refined"specialization". In fact, it has been carried on so far that even now we have the passing of the General surgeon, his work being split up among surgeons limiting their activities more and more to definite portions of our anatomy.

If this over-specialization produces increased efficiency, is it wise for one to limit his activity in a given direction, only to become stultified in all others? Many of the great leaders in our profession today are general practitioners, and to make of them a mere cog in a great machine is not consistent with their training and ambition, and can never be accomplished. Nevertheless, there are today, groups exhausting every effort to make of medicine a machine powered by collectivism and under bureaucratic control. Evolutionary and revolutionary changes lessening or destroying individual initiative have no place in the general practice of medicine.

Every great movement requires leadership, the success or failure of which depends upon the character and wisdom of its leader. So, it is with your state society. The men who are leaders in its organization are men who are not too lazy to think, and do not ask others to think for them. The present is no moment for the medical profession to allow planning for medical practice of the future by any group not trained in medicine. Is it not time to think?

It is very evident that in the past certain politically appointed state groups have repeatedly tried to attain the management and control of the state society. They have set themselves up above the group of medical men that constitutes the state society, and these same politically appointed groups assume that it is their duty to devise schedules and regulate fees for medical men in state relief work, instead of functioning in their field of licensure, health regulations and vital statistics, which is more than they can accomplish efficiently. They are self-appointed protagonists of state medicine.

The participation of any politically appointed board or any part of the state in the practice of medicine and in establishing fees, even in the small way they have in the past few months, has dangerous potentialities and may pave the way for greater participation of the state in the practice of medicine in the future.

From time immemorial it has been recognized as the physician's privilege and duty to care for the needs of his patients, whether in times of prosperity or want. This idealistic obligation to the public has always worked to the best interest of both patient and physician. The profession does not need the help of a politically appointed board to tell them how to practice medicine or what to charge for their services. And now is the time to vigorously protest such practices and prevent politics from capitalizing on human misery. It is every physician's duty to join his state society and participate in its deliberations to the fullest extent. This will be our defiant answer to the protagonists of state medicine.

The inconsistency of our "law making" bodies has defeated every measure we have caused to be enacted governing our own profession, and has admitted irregular practitioners of medicine into

the state, who are much more interested in pecuniary gain than in their ministrations to humanity. But even so, these irregular practitioners are more to be pitied than censured because they are not required to obtain the educational background necessary to practice the healing art. The same statement may be applied to the average state legislature.

The men who make up this great profession of ours are not all capable of following the great Hippocratic Code governing practice. Too often jealousies and prejudices creep in with the resultant disastrous breaking down of the faith the public places in us. We are too prone to condemn certain forms or plans of treatment devised by our colleagues, forgetting the fact that there are few specifics in medicine, and as a result of this fact, one physician's plan of treatment may secure the same results as another's. We are also too ready and too free with our own petty ideas of what constitutes "neglect," often criticizing severely before we have the facts, and no man is entitled to criticize or form opinions unless he is acquainted with all the facts. These criticisms and childlike opinions made in the presence of some of our lawyer friends, often result in a questionable damage suit against the physician, the destruction of his prestige in the community and state, and the lowering of the dignity of the profession in general. Then again, the appearance as a witness against a fellow practitioner is the height of ingratitude. The profession can only hold such practices as the *most contemptible acts* that can be committed against a fellow man. And all of these irregularities in the profession are the result of jealousies and prejudices. Please forget what your colleague is doing and try and do something for yourself.

In closing, it is our duty to help with constructive ideas so that the "new deal" will win. These ideas should not be revolutionary in character, but should be presented with thoughtful consideration. The United States is not ready for, and will not tolerate a Stalin, a Mussolini, or a Hitler, nor will they tolerate the planning for medical practice of the future by any group not trained in medicine.

The American Medical Association with its forty-eight component state associations, the American College of Physicians, and the American College of Surgeons are the great unifying forces of the profession.

These organizations must assume active control of all medical policies and determine and dominate any changes in the medical practice which present or future conditions may indicate. We must make an extreme effort, call it a collective effort if you will, to preserve forever the ancient and most treasured heritage of our profession—RUGGED INDIVIDUALISM.

NOTE—Acknowledgment is hereby made to the Journal of the American Medical Association, its editor; the Journal of Obstetrics, Surgery and Gynecology; to Dr. J. Bentley Squires, New York City; and to Dr. Oliver J. Fay, Des Moines, Iowa, for valuable suggestions in preparing this paper.

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Magee, W. G.....Watertown
McIntyre, P. S.....Bradley
Richards, G. H.....Watertown
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Crawford, B. E. ....Chamberlain
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Dickenson, W. E.....Canistota
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Donahoe, Wm. E.....Sioux Falls
Dulaney, C. H.....Canton
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Gage, E. E. .....Sioux Falls
Gregg, J. B.....Sioux Falls
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Nilsson, F. C.....Sioux Falls
Opheim, O. V.....Sioux Falls
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Bigler, Lottie G.....Pierre
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Bushnell, Wm. F.....Elk Point
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Kegaries, D. L.....Rapid City
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Miller, S. .....Senator
Mills, G. W. .....Wall
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Minty, F. W. .....Rapid City
Morse, W. E.....Rapid City
Morsman, C. F.....Hot Springs
Newby, H. D.....Rapid City
O'Toole, T. F....New Underwood
Owen, N. T.....Rapid City
Radusch, Frieda J.....Rapid City
Ramsey, Guy.....Philip
Richards, F. A.....Sturgis
Richardson, W. E.....Philip
Rogers, J. S.....Hot Springs
Sherrill, S. F.....Belle Fourche
Stewart, J. L.....Nemo
Stewart, N. W.....Lead
Threadgold, J. O....Belle Fourche
Townsend, L. J.....Belle Fourche
Walters, C. A.....Belle Fourche
Walton, J. B. .....Martin
Zarbaugh, Guy F.....Deadwood

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Kenaston, H. R.....Bonesteel
Malster, R. M.....Carter
Matousek, W. J.....Gregory
Overton, R. V.....Winner
Quinn, R. J. .....Burke
Smith, E. C. .....Mission
Walters, S. J. .....Winner
Wilson, F. D.....Winner

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Adams, J. F. .....Aberdeen
Adams, G. S.....Yankton
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Bates, W. A.....Aberdeen
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Benesh, L. C. .....Freeman
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Bobb, C. S.....Mitchell
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Burman, G. E.....Carthage
Bury, C. L. .....Geddes
Bushnell, W. F.....Elk Point
Calene, J. L. .....Aberdeen
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Case, T. J.....Delmont
Chassell, J. L.....Belle Fourche
Christensen, A. H. .....Clark
Clark, O. H.....Newell
Cochran, F. B. .....Plankinton
Cook, J. F. D.....Langford
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Craig, D. W.....Sioux Falls
Crane, H. L..LaOroya, Peru, S. A.
Crawford, B. E. ....Chamberlain
Creamer, F. H.....Dupree
Crecilius, H. A.....Volin
Cruickshank, T.....Vermilion
Davidson, Magni .....Brookings
Davis, J. H.....Belle Fourche
Dawley, W. A.....Rapid City
Dean, A. C.....Hot Springs
Delaney, Wm. A.....Mitchell
DeVall, F. C.....Garretson
Dick, L. C.....Spencer
Dickenson, W. E.....Canistota
Donahoe, S. A. .....Sioux Falls
Donahoe, Wm. E.....Sioux Falls
Doyle, J. I.....Rapid City
Dulaney, C. H.....Canton
Dyar, B. A.....DeSmet
Eagan, J. B.....Dell Rapids
Eckrich, J. A.....Aberdeen
Engelson, C. J. .....Brookings
Ewald, P. P.....Lead
Faust, J. H.....Huron
Feige, C. A.....Canova
Fleeger, R. B.....Lead
Flett, D. M.....South Shore
Freeburg, H. M.....Watertown
Freshour, Ina M. .....Yankton
Gage, E. E. .....Sioux Falls
Gelber, M. R. .....Aberdeen
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Gillis, F. D.....Mitchell
Goldman, E. W.....Madison
Graff, L. W.....Britton
Gregg, J. B.....Sioux Falls
Gregory, D. A.....Milbank
Griffith, W. H.....Huron
Grove, A. F.....Dell Rapids
Grove, E. H.....Arlington
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Hanson, H. F.....Vermilion
Hanson, O. L.....Valley Springs
Hare, Carlyle .....Spearfish
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McLaurin, A. A. .....Pierre
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Mabee, O. J.....Mitchell
Magee, W. G.....Watertown
Malloy, J. F.....Mitchell
Malster, R. M.....Carter
Martin, H. B.....Harrold
Matousek, W. J.....Gregory
Mattox, N. E.....Lead
Mayer, R. G.....Aberdeen
Maytum, W. J.....Alexandria
Miller, H. A.....Brookings
Miller, R. K. .....Madison
Miller, S. .....Senator
Mills, G. W. .....Wall
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Minty, F. W. .....Rapid City
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Murdy, R. C. .....Aberdeen
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Sherwood, J. S.....Doland
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Stewart, N. W.....Lead
Tank, M. C.....Brookings
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Torwick, E. T.....Volga
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Tschetter, Paul .....Iroquois
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Walters, S. J.....Winner
Walton, J. B. .....Martin
Watson, E. S. .....Estelline
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Represents the Medical Profession of
MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA

The Official Journal of the

North Dakota State Medical Association
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MINNEAPOLIS, MINN., JULY 15, 1934

COMFORTING THE AGED

Physicians are frequently consulted by seekers of perpetual youth. Some complain of ailments when old age is the only factor and a turning back of the hand of time is the only remedy.

Many, when they discover for the first time that they are slowing down and cannot keep up with the pack apply for relief but give age no thought. When told that this or that symptom must be expected with declining years, they are not reconciled. They become worshippers of false gods and listen to the siren lure of empty promises on patent medicine wrappers. Here their potency is cunningly questioned, implying thereby the insidious inference that sexual vigor is the infallible index of youth. Despair enters and gloom prevails.

We do not argue that the physician should practice deception and hold forth false hopes but certain we are that such individuals should not be bluntly and cruelly driven away. Persons in the age of involution should particularly be seen periodically by a doctor who understands how to prescribe medicine and dispense encouragement with the same kindly equanimity. Twilight with its fading shadows and its evening star, may well fit into a picture of quiet contentment and serene beauty in the making of which the tactful physician can often play an important part.

A. E. H.

THE HONORED PHYSICIAN

Recently I attended a complimentary dinner given in honor of a physician who had been in active practice more than fifty years. He is highly respected and loved by the public and honored by fellow physicians for the attainments in his chosen profession. The dinner was attended largely by colleagues from his own and neighboring states. During the evening many of those in attendance made short talks of the most complimentary nature showing why this physician was loved, honored, and respected.

I was particularly impressed with the remarks of one who spoke, reciting some of his experiences when he first began the practice of medicine, telling how this physician had been a great help to him in his early struggles. It happened that his first location made them neighbors. You can all recall when you first began the practice of medicine, and were fortunate enough to have a patient, how the family would show lack of confidence when the patient did not immediately improve. The speaker had that experience with his first seriously ill patient. When he saw the family was not entirely satisfied a consultant was suggested. This pleased the relatives and a consultant was called. Instead of being a help to either the family, patient or physician, he at once did what he could, such as smelling of the medicine perscribed, looking wise, shaking his head, etc., to make the family feel they had made

a mistake in calling the physician and that if he (the consultant) had only been called earlier he could have saved the patient. While that type of a physician is rare, most of you have encountered them. They are the selfish type thinking only of themselves and using any method possible to harm their competitor. In comparison to this incidence he cited another occasion when he was in need of consultation and this time the doctor in whose honor the dinner was given was called. His attitude was entirely different. After carefully examining the patient and learning of the treatment being administered by the young physician he assured the family that everything possible was being done for the patient and complimented them on their choice of a physician. Naturally the young physician was impressed by the treatment he received from the latter physician who will always be dear to his memory while the action of the former physician probably kindled in him a hatred never to be forgotten.

Can you imagine how those like the physician called in the first consultation must feel when they are nearing the end of their professional career and look back and think of the enemies they have made by unfair methods because of jealousy and selfishness while honesty and fair play would have made them friends? Think how different is the feeling of those who are willing to extend a helping hand to the young competitor and others when they are in trouble. He is storing up for himself more than riches; the love and respect of his fellow physicians. Such men are worthy of honors and when they approach the sunset of life can look back on the past with the comfort of having friends who respect and love them. Even though they may not have accumulated earthly riches they have, no doubt, laid up for themselves treasures in Heaven.

S. A. S.

MONTANA'S ANNUAL MEETING AND CHARMS

The Montana Medical Association meeting held at Helena this past week was a good one from the standpoint of program as well as attendance. In addition to the state's own excellent talent there was a strong pentalog of outside participants.

Dr. Dean Lewis speaking on "The Essentials of a Physician." Dr. Ernest Sachs of St. Louis discussed "Present Day Diagnosis and Treatment of Brain Tumors." Dr. Julien E. Benjamin of Cincinnati told of "Some Observations of the Effect of Deep X-ray Treatment of Agranulocytosis and the Clinical Effect of Amidopyrine." Dr. M. G. Peterman of Milwaukee was down for a lecture on "Epilepsy in Childhood" and Dr. W. A. Fansler of our own editorial board read a paper on "Cancer of the Colon."

Montana meetings are always enjoyable, partly because of their universally splendid programs and partly because of their charming setting. Where else can one find such an opportunity for a holiday in the month of July? The scenery is superb, the fishing is there and altogether different and the nature stories in the Yellowstone keep growing every year. If you don't believe that one about more water running over the lower falls than the upper, you can see for yourself "it *is* one drop more." And by the time the petrified forest has been explained by some native pseudo-scientist as due to "the wind making the trees rock," you are ready to forget little troubles back home and settle down to enjoy the simple, plain fun of just living. We are strong for Montana.

A. E. H.

NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. Wm. J. Watson, Holdingford, Minn., was recently married to Miss Leone Davis, of St. Paul.

Dr. J. C. Smiley, formerly of Watertown, has opened offices for general practice at Deadwood, S. D.

Dr. Sterling Dimmitt, well known Red Wing, Minn., physician, died recently at his home in Sherman, Texas.

Dr. E. E. Harrison, a prominent physician at West Concord, Minn., died last month after an illness of only a few days.

Dr. K. F. Swanson, Gettysburg, S. D., is now located at Philadelphia, Pa., being on the staff of the Presbyterian hospital.

Dr. B. F. Pearson, has moved from Minneapolis to Shakopee, Minn., where he has opened offices for general practice.

Dr. Maysil Williams, Bismarck, N. D., was in attendance at the annual conference of state health officers held at Washington last month.

Dr. P. C. Peterson, a recent graduate of the University of Nebraska, has located at Ogilvie, Minn., and opened offices for general practice.

Dr. Paul Lambertus, Parkston, S. D., was a recent graduate of the Rush Medical College, Chicago. The doctor expects to locate at Detroit, Mich.

Dr. Harley J. Gunderson, former well known Minneapolis physician, but now located at Los Angeles, was a visitor here during the week of Shriners' convention.

Dr. J. H. Heimark, well known physician and surgeon of Moorhead, Minn., died last month from a heart ailment from which he had suffered for a number of years.

Dr. W. A. Merritt, formerly of St. Paul, is now located at Albert Lea, Minn., with the Gamble clinic of that city. Dr. Merritt is a graduate of the University of Minnesota.

A newly organized hospital association has been formed at Great Falls, Montana, with Dr. G. M. Jennings, Missoula, president; Dr. W. K. Rex, Butte, vice-president, and Dr. J. W. Baldwin, Great Falls, secretary-treasurer.

Dr. Richard E. Scammon, dean of medical sciences at the University of Minnesota, will deliver the opening address before the international congress of anthropological science at the Royal College of Surgeons in London, late in July.

Dean E. R. Serles, head of the South Dakota State college pharmacy division, was granted his doctor's degree at the recent graduation exercises of the University of Minnesota, following five years of work and completion of a technical thesis.

The June meeting of the Stearns-Benton Medical Society at St. Cloud, brought out a large attendance of active and visiting members. Dr. R. C. Webb, Minneapolis, presented a paper on "Fractures" and Dr. P. E. Stangl, St. Cloud, one on "Kidney Pathology."

Dr. James Blake, Jr., son of Dr. and Mrs. James Blake of Hopkins, left to serve his internship in Jersey City hospital, Jersey City, New Jersey. He received his medical degree from the University of Minnesota at commencement exercises conducted last month.

Dr. James T. Priestly of the Mayo clinic, has been awarded the J. William White scholarship for the Study of Surgery in Foreign Countries in 1934. The scholarship was established in 1926 by the late J. William White, professor of surgery of the University of Pennsylvania.

Dr. Frederick E. Vrooman, St. Francis, Minn., passed away at his home in that city, after many months of illness. Dr. Vrooman was 61 years of age and had been in active practice for over 30 years, and will be sadly missed, as he was one of the cities leading citizens in all community work.

Discussions of technical topics were features of a dinner meeting of the District Medical Society held at Madison, S. D. Dr. L. J. Pankow of Sioux Falls discussed "Scleroderma," a rare skin disease. Dr. V. A. Mokler of Wentworth discussed the "Rocky Mountain spotted fever." Open forum discussion on general topics followed.

Dr. N. G. Mortensen, suspended St. Paul city health officer, need not resign as chairman of the state board of health, Gov. Floyd B. Olson declared to the physician who once treated John Dillinger, Indiana outlaw. Dr. Mortensen had offered to resign, but after an investigation the governor replied "your resignation is not necessary."

At the meeting of the Minnesota Academy of Ophthalmology and Oto-Laryngology recently held, the following officers were elected: President, Dr. J. S. Reynolds; 1st vice-president, Dr. H. W. Grant; 2nd vice-president, Dr. Frank Knapp; secretary-treasurer, Dr. Walter Camp; council, Dr. Kenneth Phelps; chairman, Dr. Geo. McGeary and Dr. Erling W. Hansen.

Duluth women who are members of the Women's auxiliary to the Minnesota State Medical association have made hospitality plans for the entertainment of doctors' wives from all parts of the state who will attend the annual meeting of the auxiliary to be held July 16, 17 and 18 in Duluth. Mrs. Anthony J. Bianco, president of the St. Louis county auxiliary, is directing local plans.

Dr. Douglas Corson of Fernie, was elected president of the Great Northern Railway Surgeons' association at the close of the annual convention in Glacier park. Dr. H. E. Frost, Willmar, Minn., first vice-president; Dr. Kent Darrow, Fargo, second vice-president; Dr. Russell Richardson, Great Falls, third vice-president; and Dr. R. C. Webb, Minneapolis, was re-elected secretary and treasurer.

Dr. Clayton May, Minneapolis, found guilty by a federal court jury of conspiracy to harbor an outlaw, was sentenced to serve two years in

prison and fined $1,000. Dr. May is alleged to have treated John Dillinger for a gunshot wound without reporting the incident to the police. Dr. May graduated from Milwaukee Medical College in 1911. He is not a member of the American Medical Association.

Scientific exhibits and demonstrations will be an important part of the eight-first annual meeting of the Minesota State Medical Association in Duluth, July 16, 17 and 18. Among these exhibits will be the findings of the United State public health service investigation into an epidemic of encephalitis last year. More than 1,000 physicians of Minnesota and the Northwest are expected at the convention.

A district meeting of the Black Hills Medical Society was recently held and the entire meeting was given over to the discussion of "Cancer of the Breast." Two members of the Hot Springs Clinic staff presented papers on the topic of discussion. Dr. C. W. Hargens discussed "Pathology and Diagnosis of Cancer of the Breast" and Dr. C. F. Morsman's paper dealth with "Radiology and Cancer of the Breast." Dr. E. J. Radusch, Rapid City is president of the society, and presided over the meeting.

The Minnesota State Medical Association broadcasts weekly at 11 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). Speaker, William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of July will be as follows: July 4, (Holiday); July 11, The Modern Hospital; July 18, Gastro-intestinal Upsets; July 25, Diabetes, Heart Disease and Cancer.

A bad check racket perpetrated upon several physicians in central South Dakota. A man, 20 years of age, light complexion, medium height, well built, enters doctor's office asking for a physical examination. The doctor finds that the man wishes to be treated for acute gonhorrea, which is the only part of his story that is authentic. He claims to have just returned home from college—in many cases when questioned he mentions the name and place of the college—and mentions a nearby town as being his home. He tenders a check on a local bank in amounts ranging from $7 to $10. The doctor's charge usually ranges from $2 to $5 and the young man is given the difference in cash. The check is supposed to be written by his father payable to him, and among those checks coming to our attention one was signed Larson, one Peterson and one Andrews. Watch out for him.

CLASSIFIED ADVERTISEMENTS

PHYSICIAN WANTED

Location open for new doctor. Town 800. Community hospital. Scandinavian preferred. Write for information. Address Box 69, care of this office.

LOCUM TENENS

Minnesota. Physician to take care of practice a few months. Recent graduate preferred. Details upon request. Address Box 71, care of this office.

LOCUM TENENS

Wanted by experienced physician and surgeon licensed in Minnesota. Available immediately. Good references and well qualified. Box 67, care of this office.

DOCTOR'S OFFICE

For rent in New Medical Building, located in best business and residential district. Reception room shared with prominent physician and dentist. Individual treatment room and laboratory. Free Gas and Compressed Air. Address Box 121, care of this office.

POSITION WANTED

Experienced laboratory technician wishes position in doctor's office, either part-time or full-time. Able to do medical office work, typing, and experienced in assisting doctor. Willing to work for small wages. Twin Cities preferred. Address Beatrice Sims, 1340 Oliver Ave. N., Minneapolis, Minn., telephone Hyland 3542.

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Office and operating room thoroughly equipped with furnishings—instruments, supplies, etc. New Fischer X-ray with fluoroscope. Elevator for patients. Patients' rooms very well furnished. Dining room and kitchen completely furnished. Electric range and washing machine. Simplex ironer. Oil burner. Progressive Iowa town, fine surrounding territory. Sacrifice sale—a wonderful opportunity. Address Box 70, care of this office.

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The JOURNAL LANCET

Minneapolis, Minnesota
August 1, 1934

New Series
Vol. LIV, No. 15

Fractures of the Tibia and Fibula*

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Omaha, Nebr.

SIMPLICITY is a characteristic of the life habits of generations recently passed. The beneficial effects of simple living are being somewhat impressed upon the present generation. Removal of non-essentials is conducive to stability. Simplicity in all things clarifies vision of the purpose to be accomplished.

In the past decade there has been developed for the treatment of fractures, a mechanical armamentarium so vast, abundant and varied as to be completely confusing to the unsuspecting doctor of medicine. Many possess an elaborate equipment designed by the manufacturer to treat successfully fractures in each and every bone of the body. The disarray in the average splint cabinet is paralleled by the mental confusion on discovery that the particular fracture to be treated is not adjustable to the selected splint. Attention is focussed on the splint rather than upon the demands of the injured extremity. Complexity of equipment clouds clarity of therapeutic principles.

Detailed attention to and assiduous pursuit of the three R's has made many men great. Five R's are essential in good fracture treatment:

1. Recognition.
2. Reduction.
3. Retention.
4. Repair.
5. Return of Function.

*Sioux Valley Medical Association, Sioux City, Iowa, January 23 and 24, 1934.

I RECOGNITION (Diagnosis)

1. History indicates:
   a. Mechanism.
   b. Type and degree of violence.
   c. Disability.
   d. Pain.
2. Inspection:
   a. Change of contour.
   b. Deformity.
   c. Shortening.
3. Palpation:
   a. Local tenderness.
   b. Crepitus. } Unessential in
   c. Abnormal Mobility } modern surgery.
4. X-Ray—Two planes and good quality.
   a. For detailed study.
   b. For purposes of record; clearly marked.

The history of the accident is of great value in determining the mechanism of the injury, the degree of violence applied to the injured part, the degree of immediate disability and the amount of pain. Careful inspection shows the presence of abnormal contours, i.e., swelling, angulation, deformity, shortening. In the absence of deformity, local palpation demonstrates well localized points or lines of tenderness on pressure. Palpation for crepitus or abnormal mobility is a test that can best be left unmade. It adds little to the diagnosis, produces avoidable pain and increases muscle spasm.

For soft part injuries to extremities, temporary

splinting is good therapy. Pain and swelling are decreased. In extremity injuries where damage to bone is suspected, failure to apply at once supporting dressings is inexcusable. Immediate splinting may prevent displacement in linear or transverse fractures of long bones.

Failure to recognize fracture is due always to faulty clinical and laboratory examinations. Clinically, 95 per cent of fractures should be diagnosed as such. The type and detail of the bone injury can be confirmed only by proper study in the X-Ray laboratory.

II REDUCTION (Treatment)

Early and adequate.

Muscular relaxation necessary; obtained by narcotics, general anesthesia; spinal or local.

Elements essential—length, alinement, apposition.

Methods:

1. Traction; counter-traction:
   Gentle, slowly increased; constant, in line of the extremity.
   a. Manual—uncertain; inconstant.
   b. Mechanical:
      (1) Fracture table. } Temporary for
      (2) Block and tackle. } fixation splints.
      (3) Skin traction, suspension, splints, Thomas, Hodgen.
      (4) Skeletal traction; bone penetration by pins, wires, tongs, etc.
2. Manipulation:
   a. For transverse type.
   b. For oblique with interlockable fragments.
3. Open operation:
   Only after proper skin preparation and where meticulous technic possible.
   a. Selected cases.
   b. In failures by consistent conservative effort.

Fractures are emergencies and demand immediate first aid care. The earlier, the more adequate the reduction and fixation, the better will be the ultimate result. Good early reduction and splinting will prevent much of the later undesirable swelling, bleb formation and muscle spasm. Opportunity for reduction is given only with complete muscle relaxation. The type of anesthesia necessarily is determined by the case in hand, and facilities for work. Within the first few hours while the hematoma is liquid, local anesthesia is excellent. Later, spinal or general anesthesia is essential.

The perfect reduction implies anatomic length, alinement and apposition. In weight-bearing bones, deviation from the above produces less satisfactory functional results than in the upper extremities.

Treatment of a fracture should begin when the case is first seen. Rarely is there no available material for some type of supporting splint to be applied before moving the patient. Muscle spasm early can be rather easily overcome by gentle gradually applied traction. Many fractures can be well reduced by this simple maneuver within the first ten to fifteen minutes. If very early, gentle traction be applied to overcome deformity and shortening and if the transportation splinting be good mechanically, there would be many less so-called "problem fracture cases."

The definitive treatment necessarily is determined after the X-Ray examination. Failure to make X-Ray studies of a suspected fracture within a few hours of the injury is not modern medicine. Fluoroscopic examination is not sufficient. X-Ray plates in two planes are necessary, both for our case records and for protection against many of the injustices of the so-called "good legal practice."

In fractures involving the tibia and fibula, traction and counter traction are readily obtainable. Counter traction is the less frequently used and hence renders apparent traction inefficient. Manual traction at best is uncertain and undependable. No forearm and hand muscles are able for more than a few minutes to maintain a pull of more than 50 pounds. In transverse fractures with interlockable surfaces, manual traction may be adequate as a preliminary maneuver to reduction by manipulation.

In many hospitals fracture tables are part of the equipment. Less convenient but equally efficient apparatus can readily be improvised with a small block and tackle. These devices are for temporary use only, but are dependable for holding reductions during the application of fixation dressings. The operator's hands are free for palpation and manipulation of the fracture. The forces can be maintained constantly during the time required for check-up X-Ray examination.

Certain types of tibia and fibula fractures require suspension-traction measures. Skin traction with ordinary adhesive plaster is much less efficient than with the heavier moleskin adhesive. The former will permit no more than 10 to 15 pounds pull for two weeks. The latter will withstand 20 to 25 over a similar period. In fractures of the lower one-half of the tibia, not enough skin surface is available for this type of care. Direct bone traction or a heel pin superior to the os calcis, then becomes the method of choice.



Fracture plateaux and angulation, reduction by traction.



Fracture tibia and fibula, mid and lower third oblique, spiral, Parham bands.



Fracture tibia and fibula, lower third oblique, spiral, compound, comminuted, severe, interlocking fragments.





Fracture tibia and fibula, mid-third, slight, oblique, comminuted. Loss of position Parham bands.





Fracture tibia and fibula at ankle. Posterior margin and post dislocation astragalus.

III RETENTION (Splinting)

Comfortable and mechanically correct.

1. Molded splints of plaster.
2. Circular dressings of plaster.
3. Metal splints; posterior of gutter type.
4. Thomas suspension—traction type.
5. Metal transfixing bone, incorporated into plaster dressings or traction apparatus.

Retention of the once reduced fracture becomes a major problem. Retention is as great a difficulty as reduction. Good reductions are easily lost by faulty primary mechanics. The splinting device must conform readily to the contour of the lower extremity and must extend in most cases from the proximal one-third of the thigh to the toe tips. Our personal preference is for the use of long molded splints of plaster. These splints padded with one to three layers of sheet wadding and protected by a flannel strip slightly wider than the plaster, are placed medially and externally, extending from the plantar margins of the foot, well above the mid one-third of the thigh. A smooth snug circular bandage of canton flannel is applied without reversing while the plaster is still wet; thus insuring close modeling to the contour of the extremity and preventing undue local pressure over bony points. While the plaster is setting, minor alterations of contour and alinement are readily made. Two or three thicknesses of circular plaster bandages are applied over the flannel. This gives a light, strong, closely fitting splint, readily removable. Traction is maintained until the plaster is well set; the traction bandage is very gradually removed from the ankle and the circular bandage is then completed to the tips of the toes, with the foot in the anatomic position. As union progresses the molded splints are readily shortened and used as protective support during the early stages of weight bearing.

IV REPAIR

Time of repair varies with:

1. Type and location of fracture.
2. Time and accuracy of reduction.
3. Efficiency of the retention devices.
4. Degree of damage to soft parts and circulation.
5. General physical condition of the patient.

Complete repair is shown by a condensed cortex and re-establishment of medullary canal.

The time required for fracture repair has wide variations, from a few weeks to many months. The text book dictum of six to eight weeks offers a dangerous and disappointing basis of judgment. In forming a judgment for approximate prognosis of time, careful consideration is given to the time and accuracy of reduction and retention, the type and site of fracture, local damage to circulation and soft parts, the age and general physical condition of the patient. A variation of six weeks to six months is not too great. Repair cannot be regarded as complete until the cortex is well condensed and the medullary canal is restored. In spongy bone, the striations must be demonstrable. Partial function may be resumed before complete bone repair has occured, but the degree of use must be guided by the accompanying discomfort which is a protecting mechanism.

V RETURN OF FUNCTION

Promoted by:

1. Early mobilization of joints.
2. Training in active muscle contractions.
3. Early slight weight bearing in support.
4. Active desire of patient to get well.

Return of function following any fracture is a gradual process and follows a few steps behind the repair processes in bone. Active contraction of the muscle groups in the involved segment can be intelligently initiated within the first week to ten days. Comfortable splinting permits this. This activity promotes circulation and hence aids repair; muscle atrophy is partially prevented. Active mobilization of joints is controlled much by the type of splinting. Ingenuity and individual attention can well accomplish this to some degree within the sixth to seventh week. Weight bearing is initiated while still in supporting dressing designed to prevent any undue eccentric strain tending to alter the established apposition and alinement of fragments. Callus is moldable even after, in X-Ray, considerable density is demonstrable. This soft callus needs some protection when the force of gravity, strain of weight bearing or muscle pull is applied. Many late deformities in fractures are permitted to occur by neglecting this protection in the vulnerable stage. The resulting distortion of the weight-bearing lines on the neighboring joints gives rise to undue "wear and tear" on the articular cartilages eventually producing a traumatic arthritis. Discomfort and pain from this source adds to the resultant disability.

VI IN CONCLUSION—

Ideal end result—normal function:

1. Normal contour of soft parts.
2. Anatomic apposition and alinement of bone.
3. Full range of motion in all joints.
4. Complete return of muscle power and durability.
5. Absence of circulatory disturbances.
6. Freedom from discomfort or pain.

(*Continued on Page 455*)

Controlled vs. Uncontrolled Medical Service: Comparison and Contrast

E. P. Lyon, Ph.D.
Minneapolis

THE final majortiy and minority reports of the Committee on the Costs of Medical Care have been much discussed. The numerous researches, surveys and statistical studies on which the reports were based are not so well known.

Recently, being constrained to earn a few calories by addressing a luncheon club, I undertook to present two of these publications, namely, that entitled "Medical Care for 15,000 Workers and Their Families, a Survey of the Endicott-Johnson Workers' Medical Service," and that entitled "A Survey of the Medical Facilities of Shelby County, Indiana." The word "medical" or "medicine" in these and other committee reports includes everything that is done for the cure, alleviation and prevention of disease.

The immediate choice of these reports rested upon the fact that the per capita annual expenditure for medical service was almost equal in the two cases, being $21.81 for the Endicott-Johnson Shoe Company and $21.32 for the inhabitants of Shelby County. It is noted, also that the first named report covered the year 1928; the second, 1929. The time element, and general business conditions, therefore, involved no incongruity.

In other respects the two situations were quite different. In one case we had a service paid for and managed by a corporation for the care of its employees and their dependent families. This was the controlled service. In the other case we had the inhabitants of a certain territory buying their medical care when and where each one chose and in accord with the ideas and standards of each individual. The laws of supply and demand, barter and trade found free reign. The situation was wholly uncontrolled.

In geographic setting, the first was in the fair sized city of Binghamton, N. Y., and nearby towns, where the factories and tanneries of the Shoe Company were located. The second was a farming county of Indiana. It included the small city of Shelbyville and several villages, but was predominantly a rural situation.

As to numbers of persons involved, the shoe company employees and their dependents totalled about 41,000. The inhabitants of Shelby county about 26,000. In some cases corrections will be made on the basis of these different populations.

In both cases there were people who did not use the facilities available, others who used outside services. In neither case was it possible to make corrections for this factor. The cost was, in both reports, distributed to all for whom the service was available.

If we take up now the personnel involved we find approximately as follows:

	Endicott-Johnson (41,000 People)	Shelby County (26,000 People)	Greater Shelby (Corrected to 41,000 by Adding 60%)
Physicians	28(35)*	31	49
Dentists	4**	15	24
Dental hygienists	5	0***	0
Pharmacists	4	16	26
Graduate nurses	67(97)****	4	6
Practical nurses	0	25	40
Osteopaths	0	1	2
Chiropractors	0	5	8
Christian Scientists	0	6	10
Technicians	17	1*****	1
Bacteriologists	4	0	0
Physical therapists	2	0******	0
Others	16	72	114
Total	147(184)	176	280

*The company medical service employed 28 full-time doctors and paid about $40,000 to "outside" physicians on a fee basis. Taking the average salary paid as $5,757, I estimate the total number of doctors as around 35 if considered full-time.

**The company did not furnish full dental service.

***Three Shelby dentists had "office girls."

****The company employed 67 full-time trained nurses. It also paid $39,000 for "outside" nursing service. This is estimated as equal to about 30 more full-time nurses.

*****She was also office secretary at the Shelby Hospital.

******One Shelbyville doctor did considerable physical therapy for the other doctors.

The data in the two reports from which the above table was made up are not strictly comparable owing largely to the considerable expenditures made by the company for outside part-time service of doctors and nurses. However, some things are manifest. The controlled service does not use so many doctors as are able to live under uncontrolled competitive conditions, but does employ many more nurses and scientific helpers. The cults do not appear in the controlled system. Four pharmacists were able to care for 41,000 people in the shoe company medical service. Pharmacists and drug store clerks were more abundant in Shelby County (50 people for the county), and in its imaginary larger counterpart. Readers may see the reason later on in the contrasted medicine and drug bills.

The average net annual income of the Endicott-Johnson doctors was $5,757; of the Shelby County doctors, $3,066. The lowest salary paid a company physician was $3,000. Five Shelby County physicians reported incomes less than

$1,500. The maximum physician's salary paid by the shoe company was $12,900; the maximum Shelby County doctor's income was "over $10.-500."

The comparisons of the above paragraph lose cogency when one recalls the divergency in the two situations, urban versus rural, east versus middle west, manufacturing community versus farming section. More valid are comparisons instituted between the full-time doctors of the Endicott-Johnson service and "outside" doctors of Binghamton, N. Y., and reported in the Endicott-Johnson survey. While the company paid no doctor less than $3,000, ten per cent of outside doctors of the same locality made less than that amount. On the other hand about ten per cent of outside doctors had larger incomes than anyone in the controlled service. The same tendency to wide ranges of income in uncontrolled practice is plain in the figures reported for Shelby County. This is the general law of salary incomes versus business incomes. The Endicott-Johnson survey phrases it thus: for the salaried service, from "moderately adequate" to "ample"; for private practice, from "comparative poverty" to "relative affluence." It is further to be noted that the company physicians were entitled to disability and pension benefits and other perquisites. Attendance on medical meetings and post-graduate courses was paid for by the company. Of course the Shelby County doctors had to meet such expenses individually.

It appears that thirteen company doctors had post-graduate work in the five years preceding the report; that seven Shelby County doctors had such work in the ten preceding years. It appears that three company doctors were members of specialist societies while none of the Shelby County men belonged to such organizations at the time of the report, but one was admitted to the American College of Physicians soon after.

The workers of the shoe company are entitled to free hospitalization as needed. Use is made of plant hospitals and also of the community general hospitals. The statistics reveal a greater use of hospitals under the controlled system in the year under consideration than in the *laissez faire* arrangement of Shelby County, the amount expended being over $250,000 for the former, about $55,000 for the latter. Correcting for population it appears that about twice as much was spent for hospital care in the controlled as in the uncontrolled situation.

The drug and medicine bill for Shelby County in 1929 amounted to $187,000, of which $70,000 (about two-fifths) went for patent medicines. The total medicine bill figures out about $7.42 per capita or 35 per cent of the total expenditure for medical services. Comparable figures not being given in the Endicott-Johnson survey report, special inquiry was made on this point. T. H. Platt, managing director, courteously supplied the information that their drug and medicine bill in 1928 was $57,136, and that an additional $16,659 were expended for surgical supplies. If we add these together, as Mr. Platt does (although in the writer's opinion the figure of $57,136 would be more reasonably comparable with Shelby County figures), we find that the total amounts to about eight per cent of the expenditures of the medical service. If one contrasts 35 per cent with eight per cent one surmises why the Shelby County drug personnel is so much larger than that of the Endicott-Johnson service. One infers where the medicine makers and drug trade stand on the question of planned medical service.

It is difficult to compare public health and preventive activities in the two situations. For one reason New York is more advanced than Indiana in the legal aspects of such matters. Another difficulty is found in the construction of the two reports which were made by different people and from different points of view. Nevertheless, some significant ideas can be gleaned.

In spite of an epidemic of smallpox (200 cases in the county) two years before the survey, it was estimated that only ten per cent of first grade children had been vaccinated in Shelby County at the time of the survey. In New York all children must be vaccinated before attending school. This difference is due to state laws. In Shelby County it was estimated that not more than five per cent of children under ten had been immunized against diphtheria. Comparable figures for Endicott-Johnson children as of approximately same date are not available, but New York Board of Health reports of this year place Binghamton, Endicott and Johnson City in the list of cities that have attained 35 per cent or better in diphtheria immunization. The latter two named factory towns report 70 and 79 per cent respectively. How much these excellent figures are attributable to the company medical service is left open to inference, but the director of that service reporting as to present conditions states that "better than 90 per cent of all children coming under the observation of our pediatric service are immunized against diphtheria." It seems probable that the record was not so high in 1928. No recent figures for Shelby County are available.

The tuberculosis situations cannot be statistically contrasted from the survey data, but casual references indicate that the contrast existed.

Shelby County had no tuberculosis sanatorium. Few cases could be or were sent to the small state sanatorium. For 1928 these numbered only three. The Endicott-Johnson Company maintained two cottages for tuberculosis at Saranac Lake but the number of patients cared for was not stated. In Shelby County the State Tuberculosis Association held a free tuberculosis clinic quarterly. Data on such clinics in the Endicott-Johnson service are lacking for the report year of 1928. A letter on present conditions states that their doctors, six of whom have had post-graduate work in chest work "hold chest clinics several times a week to whom are referred all the known contacts of those coming under observation who are affected with tuberculosis."

In Shelby County in 1928 there were 536 births. Counting ten born in Indianapolis hospitals (probably not included in above total) it appears that 51 babies or less than ten per cent were born in hospitals. A thirty-day canvass among Endicott-Johnson mothers showed 82.4 per cent hospitalized. Prenatal care is hard to judge from the Shelby County report. It evidently varies among physicians. "A leading Shelbyville obstetrician said that he did not see five per cent of his cases until the time of delivery." Others reported a better record and "a young physician insists that patients come to him for prenatal care—otherwise he refuses to accept the case." In the shoe company service 76 per cent of mothers received one month or more and 56 per cent six months or more prenatal care. In the opinion of Dr. Nellis B. Foster, of Cornell University Medical School, the character of obstetrics "in the Endicott Johnson organization is about the same as that of the community generally."

The per capita public health expenditure for Shelby County was 28 cents for 1928. The amount recommended by public health authorities is $2.00 per capita for adequate rural health serivce in the preventive field. The preventive work done by the Endicott-Johnson medical service cannot be separately evaluated as their physicians did this work as part of their regular duties.

In Shelby County the inhabitants had entire individual freedom in the choice of medical service. Among the Endicott-Johnson workers the same kind of freedom existed. Among the 80 per cent of such workers who made exclusive use of the company medical service the choice was limited to the doctors employed. It was the policy to give as much choice as possible among the physicians available "within the limits of the doctor's case-load."

The following table shows the per capita annual expenditures in the two situations under consideration as nearly as can be made out from the survey reports and other data:

PER CAPITA EXPENDITURES

	Endicott-Johnson (Controlled Service)	Shelby County (Uncontrolled Service)
Services of physicians	$ 4.88	$ 6.10
Drugs and medicines	1.80	7.42
Hospital care	6.19*	3.14
Services of dentists	?**	2.19
Services of other healers	..	1.61
Nursing care	5.00***	.58
Public health	?****	.28
Office expense	1.22*****	..
Miscellaneous	2.72	..
	$21.81	$21.32

*Includes tuberculosis cottages and convalescent farm.
**Limited dental service included in total but not separately accounted for.
***Includes "lay helpers," technicians, etc.
****Included in total.
*****Includes ambulances, taxes, depreciation.

Fractures of the Tibia and Fibula

(*Continued from Page 452*)

Disability results in more than 95 per cent of cases. The degree of disability depends on—

1. The severity of the injury.
2. The reparative capacity of the tissues.
3. The attending surgeon; his judgment, skill and ability to control the conditions of treatment.
4. The patient; age, co-operation, tolerance and desire to get well.

Personality Problems of the Modern College-Girl*

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THE problems of the modern college-girl are only particular cases of the problems of all women in our civilization. Let us consider first what has been happening to our civilization in recent years, and what has been happening to women in it.

For primitive man life was simple, with plenty of time for rest, meditation, social contact, singing, dancing, feasting, and religious ritual. The male was the economic provider and the fighter, and the female bore children, taught them, largely through example and by her maternal love, how to be human beings; she was the center of the home. From her maternal instinct, and not from sexuality, was derived feeling, or tenderness, or caring for people; feeling was extended from children alone to the sexual mate, to a tribal group, finally to all people in the form of the amenities of civilization. Men learned all of the feeling which they have by imitation of the women; animal and primitive sexuality has no trace of feeling in it, being only lustful and cruel, and succeeded by indifference.

From masculine instinct and from the necessities of life men obtained their chief consciousness with regard to external objects, collecting experience as to what kind of things there are in the world and how they behave. They naturally went on to enquire *why* things were as they were, and *why* they behaved as they did: this was the beginning of *thinking*. From these simple beginnings the main characteristics of our civilization have been derived, the man's and the woman's contribution developing side by side, both indispensible to the continued existence of the race.

The masculine adaptation, factual and intellectual, resulted in the practical management of affairs, which became more and more complicated, i. e. harnessing the energies of nature through great machines, developing a stern competitive system out of the instinct to fight, and finally producing pure and unapplied thinking, or modern science. The more this has developed, the farther we have got away from the instincts, with a consequent heavy increase in the strain of life: the instincts have a direct access to the whole sum of psychic energy, and their exercise brings refreshment rather than fatigue; the cortically located thinking function can be used only by the expenditure of consciously willed energy. The characteristics of our modern life, compared with that of only a few years ago, are the insensate hurry and competition, the preoccupation with *things*, and with activity, hence materialism, and the loss of internal values: the valuation of *doing* alone and not of *being*; and a complete subserviance to rationality. We have very largely lost the values inside of ourselves, the healing properties of meditation, and the digestion of experience, religious values, all that is properly called spiritual rather than material; even recreation has become as feverish and as extraverted as our work. This is all a monstrous exaggeration of the masculine life of the primitive, and in its present form is difficult for men themselves to carry, to the point of exhaustion and nervous breakdown. How much more difficult is it for women, for whom this kind of thing is much further from their instincts and from their traditional culture of thousands of years!

The woman's contribution to our culture developed during the same period in which men were forging out the fine-edged tools of objective thinking. Her indispensible duties to the child are only begun with the act of giving it physical life; she must nourish it and care for it through years of helpless dependency. She is still the great custodian of all that is best in our hereditary culture; by this I mean something far more deeply placed, more voluminous, and far more important than the trivialities which are learned from books later on: I mean that she teaches the child from birth until he leaves his home, unconsciously and by imitation of her own reactions, to be a human being instead of an animal or the savage which he would otherwise be; of all of this culture perhaps the most important element is in the feeling attitude which is responsible for all the amenities and decencies of life. Helen Keller was a wild and screaming little savage until Miss Sullivan had brought her, through the bond of love which she had to develop first, under the usages of civilization. Woman's service does not stop with children, however; almost all that makes life suave and agreeable for man as well as woman,

*Read before the fourteenth annual meeting of the American Student Health Association, Chicago, December 29, 1933.

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is the creation of the latter, and the extension of her instinct and her ancient culture of feeling. Woman throughout the ages has been chiefly preoccupied with relationship: this is life to her, and deprived of it she shrivels. Men must have it too in order to reach their highest spiritual values; but they must have it through the woman, because they do not have it in instinct nor in ancient culture.

About a hundred years ago a new demand began to be made on woman, namely that she invade the field which had previously belonged almost exclusively to man, become as conscious of external material things as she was of her feeling and of her spirituality; and that she begin to *think* consciously and objectively. This has become now so much a matter of course that it is instructive to go back to a time before this demand was made, and see again what life was like. Jane Austin wrote her stories about 1820, and they give, perhaps "Emma" most fully of all, what is doubtless a correct and sympathetic view of the culture of that time at its best. Here we see women functioning almost exclusively through feeling and intuition, and it must be admitted that the picture is rather a delightful one: woman occupies her place fully secure in the value of what she contributes to society and to the individuals about her; with a certainty of touch and a rare skill in her handling of the human elements in every situation which we do not so frequently see nowadays. There is conspicuously lacking any suggestion of animosity against the man because he belongs to the tyrant sex. Practicality and rationality are unquestioningly left to him, with the implication, it is safe to infer, that "we do not care to bother with that kind of thing, and they know how, and are glad to do it for us." Life was easy for both men and women: what was instinctive for women was fully adequate to meet every demand which life made upon them; men were doing the things which they preferred to do, and going home to a feeling atmosphere in which they could luxuriate without the responsibility of having themselves to help manufacture it. But Emma and her life have passed away forever, and the few survivals of her type are outworn and regressive in our modern world. We cannot here describe the campaign to achieve this incredible extension of woman's life. It meant liberty in some respects, but much more, it meant added responsibility, and the assumption of a much more difficult role in life; especially as woman could not take on the new *instead* of the old, but must take it on as an additional burden, and continue to do her indispensable feminine work as she had ever done it. Why should this astonishing claim of new duties ever have been made? There may have been many reasons, but they are essentially one—i. e., the activity of a constituent of the human soul which drives relentlessly for an ever widening consciousness. The human race never evolves smoothly from one attitude to another; we must have wide swings of the pendulum from one extreme to its opposite, and there must be emotion in the situation to act as the motive power, often emotion of a negative and violent sort. Three extreme and emotional assumptions began to be made by the campaigners for the new order; first, that the former adaptation of women was ignoble and valueless; second, that the lot of the male was glorious, free, invariably satisfactory and successful, more valuable and far pleasanter than their own; third, they began to conjure up animosity against the male, individual and collective: it was all men's fault that women were held in their shameful position and kept out of their own glorious opportunities and freedom.

These three assumptions, in spite of grains of truth in them, were essentially false ones; but for the ardent campaigner of the latter half of the last century they had all the validity of cosmic truth. Necessary as it may have been for campaign purposes to believe these things, it is not any longer necessary, and is actively harmful, most of all because the feminine traits and accomplishments in which the woman secretly delights, and on which she must nourish herself, are both consciously and unconsciously belittled. The old feminists made it one of their chief complaints that *men* undervalued the work of woman; whether this was generally true or not, it is certainly a fact, and one of far greater significance, that women themselves in this enlightened age are grossly undervaluing that without which the world could not endure physically, and without which it would revert to complete savagery and animalism.

For instance, the value of the family and of marriage have been deeply attacked from a number of angles. It has become the fashion in certain quarters to describe the family as "nothing but" a nest of incest, or a battle-ground in which children are warped and "fixated" in various abnormal complexes. It is baldly asserted that all the needs of children are better met by some hired maid, or professional nurse, or in the sterilized and emotionless air of a state nursery. That children cannot live and develop without *love,* is spoken of as an antiquated theory which modern rationalities have put into the waste-basket. We are informed that marriage is nothing but an

outworn convention legalizing sexuality: that civilized social relations are either the interchange of information and ideas, or else they are nothing but the sexual impulse and its gratification. This depreciation has gone so far as to judge that the woman who has brought several children into the world, reared them in an atmosphere of stable affection to good manners, good morals, real cultivation, and the thousand indispensable attitudes with which to meet life, who has at the same time been a true companion, and inspiration, and a help to her husband, and builded about herself a real center of friendship and joy: such a woman has done something rather inferior, or at any rate, not to be compared with the filling of a routine office job. How could woman who labored through the millennia to create these human and spiritual values ever have accepted such a warped view of her own handiwork?

Now the modern college-girl, like all other women, is being driven away from her instinctive and cultural self towards an attitude which she cannot assume without tension and strain. And still the instincts hold her and the old ideals of what a woman should be. She is torn in two by the demand to be a man, or to show that she is the equal or superior of any man, and at the same time to be a woman as well. Is it a wonder that the adolescent girl is confused in the melee, or that she shows the effect in unhappiness, adjustment problems, neurosis, and perhaps breakdown? The positive side of the challenge we see in a type of girl whom Jane Austin never dreamed of: clear-eyed, self-confident, honest and direct, willing to meet the give-and-take of life, with a respect for facts and truth and reason, a capacity to be objective and impersonal: and withal sufficiently womanly in the age-old way, still ready to assume the indispensable tasks that only a woman can do, and that only a superior woman can do in a superior way. The negative side shows itself in a number of ways which I think it important to describe in some detail.

Without exception under the challenge to meet the new demands and to keep true to the traditional and instinctive values, the modern girl is carrying, quite unconsciously to herself, great inner tension. Where the primitive or the eighteenth century girl moved with serenity and relaxation through her daily circle, the modern girl is like a violin string stretched taut between the new and the old. Any observer from the Orient, and even from Europe, recognizes this tautness, its strain and its high efficiency, in the American girl.

This tension shows itself in the way she does her academic work, very different indeed from the boy's way. Of course she has demonstrated that she is fully capable of meeting and exceeding the boy's class-room standards, but it is at the price of hard driving which very few boys will do. It is partly her natural docility, but it is also a compensatory mechanism for her greater insecurity, and her fundamental resistance to the bald intellectual approach. She has to *will* herself to work hard because she is less familiar in the intellectual field and less interested in it. A boy moves more familiarly and carelessly in this domain: he can take it or leave it, neglect his work, or plunge headlong into it when it deeply interests him: he is a fish, swimming in his own element. The extreme results of the strain are to be seen in the girl who becomes obsessed by her lessons, works after midnight day in and day out, and loses all sense of proportion. Or in the girl who reacts negatively in the same obsession, and drifts aimlessly and desperately about, even threatening suicide because she is a complete failure in life. Or in the emotionalism which girls display at examination time, or over a bad report. In these cases there is always the split between the old and the new demands; the old is usually, in the modern college girl, unconscious, since consciously she repeats only the formulae of modern rationalism. When she learns to let the instinctive and cultural feminine needs come up into consciousness and reassert their claim to the preeminent place in her being, she recovers her center and her energy and her sense of proportion. The studies no longer assert their hypnotic power over her; but she can do what intellectual work she needs to do.

This brings us to the more important fact that even though she has proved that she can do excellent intellectual work, still, by and large, she is not deeply nourished by this approach to life. When she can grasp her work from the human point of view, she warms and kindles; but when, as is the usual case, the approach is only from the factual and rational side, she finds that she is being fed with sawdust. What a pity that there is not more general realization of the different needs of women and men in all their education! Unfortunately the boys are bored and lifeless under the presentation which brings the girls to life, and as women have insisted for the most part on sharing the men's courses, the women's needs are sacrificed.

The difficulty of her position is also reflected in the girl's group adaptation. Of course there are great individual differences which are of the utmost importance, but I see girls of widely different types straightening out their social relations

by learning to value sufficiently the neglected feminine reactions in themselves. One girl will give the picture of great insecurity and confusion, shyness, awkwardness, nervous habits, even hysterics. Another girl with fundamentally the same trouble has steeled herself to the task by repressing her feeling side; she gives the appearance of glacial coldness, will allow no warmth of feeling to come to the surface towards either her boy or her girl companions, withdraws into her room, pursues a solitary way: such a girl is usually deeply resentful that she has been sent for psychological help. Neither of these girls knows that she is suffocating a whole aspect of herself without which she cannot live: both deny the existence of such a thing, but when they can be brought to acknowledge that they have and need feminine feeling, they astonish themselves by the wealth which manifests itself, and the new ease of their adjustments.

Many girls show the strain by compensating with an excessive thirst for power. A girl will concentrate all her hopes and plans upon a feverish round of activities, on making a sorority, or some political office. She may become heartless and unscrupulous, delinquent to her own needs in other fields, and towards all her human relationships. We may say this is the result of identification with the masculine point-of-view (or better to call it a travesty on the same), to the effect that "the only thing worth while in life is achievement and success."

One girl came to me complaining that she had suddenly become constrained and very unnatural with some boys with whom she was working on the college paper. She said that she had been working very hard for a year to achieve a competitive place on the paper, and that the boys were to make the election. Recently the competition had narrowed to another girl and herself. The other girl was openly bidding for the position by currying favor with the judges; she herself supposed that she, too, ought to do this: become hail-fellow-well-met with them, flatter them, make every opportunity to "date" them; in fact she *had* tried to do just this, but complained that she was stupid and awkward about it. "What is the matter with me," she asked, "that I can't be free and easy with them, and 'apple-polish' them like the other girl?" I asked her how she really felt toward these boys. "I like them very much, and I've enjoyed my work with them." "All right: which is more important to you, the friendly companionship you are developing with them, or the position?" She answered, "The companionship." "Then you will have to choose to be true to what your best feeling tells you to do with them, and let the position go to you or to the other girl, whichever way it happens." The girl experienced immediate relief, and went back securely and happily to her comradeship and work with the boys.

Another girl came in an incipient breakdown which she likewise attributed to worry over potential office; actually we found that she had shut her door upon a real love affair, and also against her best girl friend; and thus she had almost killed her native energy. The only thing left to her, she thought, was a successful college career. As soon as she could open that closed door, and revive the central life of her affections, the obsessive importance of the office vanished.

Still another group of girls will show their confusion of values by giving themselves up to frivolity and the whirlwind pursuit of pleasure and excitement. In this the girl may be partly motivated by power, her desire to score as the most popular in her group, but often the picture seems to be purely that of thirst for sensation. This is part of the great overemphasis of today on *doing* rather than *being*. Such a girl will show her tension by the intensity of her restless search for new diversions, and also by her neglect of all of the aspects of reality in her situation, such as the claims of her collegiate work, and of her real relationships. She is the girl who slap-dashes through her courses superficially, who may begin to do underhanded little things like using other girls' work, using their clothes, capturing their friends, evading house rules about late hours, etc. She may "come a cropper" with the collegiate or student authorities, or outrage the friendship of her own group, or of older people responsible for her. She lacks a platform of genuine regard and affection, and of honest achievement alike: she has lost the integrity of the old-fashioned girl living truly from her affections, and she lacks the integrity of the modern girl who meets the college demands fairly and honestly.

Twenty years ago the movement for general sex education was getting well under way in place of the policy of complete silence on the subject, and many of us had high hopes that it would solve most of the difficulties of marriage and relationship. Time has shown that our hopes were too high. There is still unhappiness in marriage, still confusion in relationships. At the same time there has been unloosed a flood of talk until sexuality has become an obsession. Movies, plays, popular novels, and even essays unite in presenting youth with a picture of life which is as completely distorted in the direction of exaggerating sexuality and sexual irregularities, as was the

Victorian literature in ignoring or glossing them over.

With respect to sexuality, girls should realize the difference in the nature of man and woman. Men are by nature conscious of its aspect as a *sensation,* in a way which practically no woman can imitate, and they also apply their *thinking* to it in the form of principles which are valid for them, even though they may occasionally lay the latter aside. Women must have *feeling* associated with their sexuality to make it possible at all, and they are prone to behave with little reference to straight thinking when their affections are involved. In the case of nearly every man sexuality is a matter almost purely of sensuality unless he has accepted his social responsibility through marriage: he has no feeling, no affection and tenderness which is necessarily associated with it, and in illicit relations at least he repulses every attempt to make it anything else than what it is primitively to him. The perception of this attitude is horrifying to any girl who has her first illicit experience: she may not see it at once if she is in love, but eventually she does, and this leaves her the alternative of either withdrawing, disillusioned and sickened, to take better care in future, or of trying to imitate the man's attitude. The latter involves, of course, that she must accept exclusive sensuality; and this her nature will not allow her to accept without the loss of all her feminine qualities. The picture is a typical one of the girl who has forced herself against all of her feminine instincts into sexual promiscuity: hard, cynical, disillusioned, lacking in feeling, with no soul, because this factor in her has been paralyzed, with no respect for men, with no belief in the real value of anything on earth: one may as well have as merry a time as possible, since anything else is old-fashioned sentimentality and hypocrisy. Many of these modern youngsters who claim to be sophisticates, have a view of life which is much farther from actuality than were the romaniticisms of the Victorians.

There are at least two other factors in the friendship of boys and girls which have nothing to do with sexuality proper, and which are much more important. One is the recognition and enjoyment of real qualities in each other, such as interest, charm of feeling, consonant tastes in music and other things: the kind of thing which is the basis for affection between two men or two women. The second is based on the phenomenon of inspiration; the perception of an ideal image through one of the opposite sex. Dante saw Beatrice first when both were in their ninth year; even then he recognized her as the embodiment of something very glorious in *himself,* a vision sent to him by God. They saw each other apparently only two or three times; she married someone else, and may hardly have known of his existence, and died at the age of twenty-five; yet she remained until his own death the inspiration of all of his work. We are not all Dantes, but every man needs to unloose his potentialities through an actual woman, and every woman also must find somewhere in the flesh a man who will set free her soul for her. This is *not* a phenomenon of sexuality, and the addition of the latter, except through marriage, is almost sure to sully and destroy the spiritual image.

This ideal image which the man throws on the women he loves, and to a lesser extent on every other woman as well, is one of perfect purity. Every man, no matter what his own practices have been, much prefers to marry a woman who has kept herself "pure." Even though he may himself have been the cause of her offence, he is unconsciously alienated. It happens now, as it has happened for centuries, that a couple genuinely in love have been swept by nature into a sexual experience which neither intended: the man, if he is of quality, regrets this because it is against his rational principles, and it does not accord with the image of purity which he throws on the woman he loves. He is likely to urge immediate marriage to legitimate the relation, but he sometimes finds to his surprise that the woman, whose feeling was fed by the connection, refuses to regret it, wishes even to repeat it, and sees no reason for hurrying the marriage. The man can understand and forgive being carried away once by passion, but persisting in an illicit affair is another matter: it is against his ideal for the woman, and against his rational and common-sense principles which still have their influence with him even though he has violated them. The upshot often is that after a certain period, during which the woman has become more and more deeply in love, she finds that the man has cooled towards her and wishes to be released. This is one of those facts in life which may not be fair and just, but which, because a fact, needs to be recognized. The modern girl wails as did her great-grandmother, "The men use every art to force us to have sexual relations with them, and then they no longer respect us!"

Thus, in summary, when we come to the relations between boys and girls, we see many girls able to bear the tension between the new and old ways, conduct themselves in a natural feeling way towards the boys and develop good friendships

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An Inaugural Thesis Presented to the Minneapolis Clinical Club

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Stereoscopic Vision

Introduction

MAN OWES his high place in the universe largely to vision. A special type of vision called stereoscopic was an important factor in the rise of the primates which culminated in man. In man himself it is not present at birth, but develops during early childhood. After defining stereoscopic vision I propose to discuss its relation to the evolution and the development of man.

Explanation of Stereoscopic Vision

Vision with two eyes differs from vision obtained with one alone. Besides being more distinct it makes objects more solid looking, giving an impression of relief. This type of vision, obtained through the fusion of the slightly dissimilar images of the two eyes, is called stereoscopic vision. It requires that each eye view an object from a slightly different angle, and that the two images be fused in the brain into a single image with added solidity and relief.

With one eye alone we can judge the position of objects fairly well. We are aided by factors derived from past experience. Duke-Elder[1] has listed these factors, all obtained in single-eyed vision, as follows:

1. A real perspective.
2. Distribution of light and shade.
3. Over-lapping of contours.
4. Geometrical perspective.
5. Interpretation of size.
6. Parallactic movements.

1. Areal perspective refers to the softened outline of distant objects due to the imperfect transparency of the air. Distant hills are covered with a haze of azure blue. In regions where this haze is absent, far-off mountains seem much nearer than they actually are.

2. Distribution of light and shade is used by photographers to advantage in giving an impression of relief to their pictures. Photographs taken on a dull day show few high lights and shadows, and for that reason usually appear flat. Those taken in mid-morning or mid-afternoon in sun-light have large shadows and definite relief.

3. Over-lapping of contours refers to the partial concealment of one object by another, determining for us which is behind and which is front.

4. Geometrical perspective is based on the tendency of parallel lines to meet at the horizon. One sees this in looking down a long stretch of railroad track, the rails appearing to meet in the distance. The same principle influences the appearance of buildings. All roof and floor lines, extended, meet at one of two points on the horizon.

5. Interpretation of size depends upon our previous experience with an object. When the size of an object is known we estimate its distance by the size of its image. When one sees a man working in a field and he appears small, he knows from experience that he is not small, but that he is far away.

6. Parallax differs from these others in that it requires movement for its appreciation. When a middle plane is regarded and the observer moves his head, objects beyond it appear to move in the same direction as the observer and those in front of it, in the opposite direction. This is of great aid in determining the relative distance of objects.

Duke-Elder[1] has pointed out that all these influences depend upon the experience of the individual and that in the aggregate they can produce a very truthful impression of depth, distance and solidity.

When we look around a room with one eye and then with both, there is little difference to be seen. However, when we try to thread a needle with only one eye we have difficulty. The accurate perception of depth, especially for objects close at hand, requires stereoscopic vision.

This type of vision necessitates the simultaneous presentation to the brain of two slightly dissimilar images. These images are combined into a single perception of form and position which exceeds in accuracy that obtained from either eye alone.

This stereoscopic type of vision is possessed only by man and monkeys. In all other animal the two eyes act separately.

Vision in Various Representative Vertebrates

Fish

The eyes are on the sides of the head, per-

mitting a broad view to either side, forward and above. Most fish cannot see directly below or behind. They are near-sighted in water when their eyes are at rest. Distant objects are brought into focus by a muscle which pulls the lens backward. In most higher animals focusing is accomplished by changing the shape of the lens rather than its position. Some fish may possess color vision, though the evidence at present is conflicting.

Reptiles

The eyes are at the sides of the head. Vision is poor, these animals relying more on other senses than that of sight.

Birds

The eyes are at the sides of the head, and rotate but little. This is compensated for by a small light head which moves easily and quickly. Birds alone of all animals possess a visual acuity greater than that of man. Some of them, especially the swift fliers, have two or three maculae, or areas of acute vision, furnishing them with keen vision in several directions at once.

Rodents

In rabbits, squirrels and rats the eyes are placed prominently at the sides of the head, permitting vision in all directions. A squirrel can see some one directly behind him.

Herbivores

In cattle, horses and deer the visual axes are somewhat forward and outward. While their ability to distinguish detail is not good, their ability to perceive movement to objects is excellent and warns them of approaching enemies.

Carnivores

The hunters, like the cats, dogs, lions, and tigers, have eyes at the front of their heads, with the visual axes not parallel but forming acute angles. Not often preyed upon themselves they do not need to see to the side or behind.

Primates

This, the highest class of mammals, comprises the monkeys, apes, and man. The eyes are at the front of the head and the visual axes are parallel. The central area of the retina has become highly specialized into a macula lutea, permitting more acute vision than is possessed by any other mammals. All this group except the lowliest members possess stereoscopic vision.

Evolution of Stereoscopic Vision

We can learn something about the vision of man's ancestors by studying it in the series of vertebrates that G. Elliot Smith[4] regards as the nearest relatives of man now available for examination. These animals are not in the direct line of descent of man, but are nearer to it than any others living. The series presents a tentative sketch of the geneology of man as far back as Eocene time, a matter of perhaps ten million years.

Tree-shrew

This little animal, found now only in Malay and Borneo, is the size of a chipmunk and feeds on insects and fruit. It has remained little changed since the close of the Age of Reptiles when all mammals were still small and generalized, and when it separated from the early primates. Lacking a macular region in the retina, its vision is not keen, and its visual axes turn outward.

Tarsius

A resident of the trees deep in the jungles of Malay, Borneo and Java, this animal lives on fruit and insects. It is the size of a small squirrel, has a long tufted tail and protruding ears. It may be regarded as a living fossil, and has been described as the most primitive of living primates and the common ancestor of all the primates. The eyes face directly forward and the visual axes are parallel. The fact that the eyes move but little in their sockets is made up by the ability to turn the head directly backward. Though there is no macula, the area at the center of the retina is thickened and thrown into folds, showing a beginning of specialization there. Vision for discriminating fine detail is not keen. Decussation of the optic nerves is almost complete. The visual cortex occupies nearly a third of the neopallium. (4, 9).

Monkeys

Primitive monkeys arose in Eocene time from tarsius-like stock somewhere in the region of Central America. Crossing land bridges to South America, Europe and Africa, they differentiated in various ways, and gave rise to the present forms of monkeys, apes and also to man. The eyes face forward and visual axes are parallel. At the central portion of the retina is a true macula, an area specialized for acute vision. The eye-balls rotate through a fair range and there is some degree of stereoscopic vision.

Apes

The gibbon is the most primitive as well as the most ancient of the anthropoid apes. He has persisted with singularly little change since Miocene time.

The chimpanzee maintains binocular fixation better than the monkeys, though not as well as man, and possesses a high degree of stereoscopic vision. In many ways he seems more closely related to man than any other living apes.

Stereoscopic Vision in Man

In man stereoscopic vision develops during the early years of childhood. Soon after birth a baby glances toward a bright light, showing a predominance of macular vision, but both eyes do not always turn at once. One may be to the right while the other is to the left, though one is never up while the other is down. Even at this early age the nervous mechanism for maintaining vertical balance is perfected. At six weeks a baby fixes with both eyes part of the time, and by six months shows some desire for binocular vision. At the age of one year a baby will overcome strong prisms placed before its eyes, in the effort to overcome double vision. During the next several years the use of the two eyes together becomes firmly implanted, and the faculty of fusing the images obtained from each is established. This is the beginning of stereoscopic vision which continues to develop until about the age of seven years.[12]

Normally a child's eyes are moderately farsighted. If they are extremely so, or are astigmatic, the effort to see clearly is too great and one eye gives up, turning out or in to avoid double vision. Double vision is still further prevented by suppression of the image of the deviating eye. When the vision of one eye is suppressed in a child less than six years old, that eye loses its ability to see clearly. Unless it is made to see before the age of seven it is apt always to be a poor eye with little chance of gaining normal visual acuity.

Correction of the refractive error with glasses usually removes the obstacle to normal vision. Under six years the nervous mechanism is still so plastic and the desire for binocular vision so inherent that with glasses, visual acuity improves and the eyes become straight.

Where the squint is neglected beyond the sixth year, either in the hope that the child will outgrow it, or because spectacles are not becoming, vision remains poor permanently in the deviating eye and the squint is not much affected by wearing glasses. Moreover, because one eye does all the seeing, there can be no stereoscopic vision, and accurate, fine work with the hands becomes impossible.

As soon as a child is old enough to name simple pictures, it should be determined that he sees clearly with each eye and that the two eyes are parallel. If the children who failed to meet these requirements were properly cared for there would be few cases of crossed eyes to correct by surgery, and almost everyone would have normal visual acuity and well-developed stereoscopic vision.

Summary

Stereoscopic vision is a true percept. It seems to have been a factor in the evolution of the Primates, and in man, the highest member of this group, it appears and becomes perfected during childhood. Because of its great aid in accurate work with the hands it is important that its significance be appreciated and that in the care of the eyes an effort be made to preserve it.

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Diagnosis and Treatment of Tumors of the Spinal Cord*

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SINCE many intraspinal tumors are benign and operable, and since they grow slowly and produce irritation of spinal roots before compression of the cord, it seems justifiable to call attention to the symptoms they produce and to the newer methods of diagnosis employed, with the hope that the tumors may be recognized and removed before advanced paralysis develops. They may arise from the meninges, tissue of the spinal cord itself, or blood vessels. Occasionally neoplasms of the vertebrae and disks grow into the spinal canal and produce compression of the cord. When this occurs they are grouped with the intraspinal tumors. Metastatic tumors of the spine are not included in this consideration.

Pathology

Tumors of the supporting tissues, cord, roots and vessels occur at all levels with equal distribution. They develop most frequently in the second, third and fourth decades of life, and by far the majority of the tumors are benign and encapsulated.

A review of cases in which operation was performed at The Mayo Clinic includes a study of 447 cases. In 111 cases (25 per cent) the tumor was situated extradurally; in 223 (50 per cent) the tumor was situated subdurally but extramedullary; in 113 (25 per cent) the tumor arose from the cord or the filum terminale. Twenty-five per cent were neurofibromas; 24 per cent were meningiomas. Eighty per cent of all intraspinal tumors were removable, with a mortality of four per cent.

Symptoms and Signs

Tumors arising from the nerve roots, blood vessels, and meninges invariably pass through three distinct cycles. Frazier referred to these as: (1) root cycle with manifestations of pain; (2) partial compression of the cord with the Brown-Séquard syndrome, and (3) complete compression of the cord with loss of all motor and sensory functions below the level of the lesion.

The first cycle, characterized by root pain, is a rather common phenomenon, since 50 per cent of intraspinal tumors are subdural but extramedullary, and are attached directly to or produce traction on one or more of the sensory roots. The duration of this cycle usually continues for from one to four years before evidence of paralysis develops. The character of the pain is nearly pathognomonic, since it persists in a localized area and radiates over the same nerve root. It is usually lancinating, and is aggravated by coughing, sneezing, lifting, and straining at stool; invariably it awakens the patient from sleep four to six hours after retiring, and often becomes so severe as to compel the patient to walk the floor or sleep in a sitting position. The mechanism of this pain apparently is due to the ball-valve action of the tumor which is forced downward by the increased pressure of cerebrospinal fluid above the tumor, thus producing traction directly or indirectly on the nerve roots. Unfortunately, many of these patients are treated for neuritis and muscular rheumatism, and are even operated on for supposedly existing abdominal disorders. Therefore, when one encounters a patient with persistent root pain, such as unilateral or bilateral sciatica, which has failed to respond to the usual types of accepted treatment for sciatica, it behooves the examiner to consider the possibility of intraspinal tumor. The same is true of persistent root pain radiating over the wall of the thorax or into the abdomen, which fails to subside with ordinary treatment, and does not correspond with the usual thoracico-abdominal complaints.

It was found that 10 per cent of the patients presenting root pain had been operated on, either previous to or following their admission to the clinic, for some thoracic or abdominal lesion other than that of tumor of the spinal cord. This emphasizes the importance of recognizing the symptoms within this first cycle. The presence of these persistent root pains aggravated by coughing, sneezing, stooping or lifting, and their development when the patient is reclining, further suggests that the tumor is movable. It is during this period of development of a tumor that roentgenographic examinations with radiopaque oil prove of inestimable value, since often indentation in the flow of these oils is revealed before the tumor is large enough to produce symptoms

*Abstract of paper read before the Sioux Valley Medical Society, Sioux City, Iowa, January 23, 1934.
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of compression of the cord. It must be remembered, however, that whereas pain is one of the early symptoms of many intraspinal lesions, yet tumors that are fixed and not movable, such as those arising from the bodies, disks, or from the cord itself, are capable of growing to such size as to produce symptoms of compression of the cord without the atypical root pain.

The symptoms that develop in the second cycle differ from those in the first, in that neurologic evidence of compression of the cord now becomes manifest. They may develop simultaneously with the existence of pain, or they may develop without the presence of pain. If the tumor is situated anterolaterally, the symptoms will progress and simulate the classic Brown-Séquard syndrome, with impairment of motor and tactile sensation on the same side as the contralateral loss of pain and temperature sensation. Joint and vibratory senses are usually disturbed on the same side as the tumor. If, however, the tumor is situated in the mid-thoracic region, disturbances in the tactile, joint and vibratory senses will be elicited before impairment of motor function becomes obvious. The reverse may be true if the tumor is situated anterior to the cord. It is apparent that loss of motor or sensory function will be gradual, and will increase in proportion to the direct pressure on the cord. Often months to years pass before complete loss of all functions of the cord below the level of compression takes place, and represents the syndrome obtained in the third cycle.

The vesical and rectal functions are rarely disturbed during the second cycle unless the tumor is an intramedullary one, when obstipation and retention of urine may be among the first symptoms.

The sensory and motor levels of involvement are usually sharply defined, and correspond to the segment of the cord involved in extradural, subdural and extramedullary tumors, whereas in intramedullary tumors they are more likely to be indefinite and to shade gradually into normal. Intramedullary tumors occasionally will reveal that the sensory loss is greater in the segments involved by the tumor than it is below the tumor, so that the sensory chart may reveal gradations of impairment downward as well as upward from the level corresponding to the tumor.

Tumors arising below the conus in the spinal canal from roots, blood vessels, meninges and the filum terminale invariably produce the classical syndrome of pain without the development of the Brown-Séquard phenomenon. Reflexes are usually decreased in their activity, with loss of motor power. Disturbances of vesical and rectal functions usually develop simultaneously with the loss of motor function instead of subsequently, as observed when the tumor is situated opposite the spinal cord without invading it.

Neurofibromas of the sacral nerves, and chordomas of the sacrum, invariably produce localized pain and dysfunction of the bladder before saddle anesthesia is manifest.

Spinal Puncture—Examination of the spinal fluid is of inestimable value in furnishing information concerning the physical and hydrodynamic properties, and the chemical reactions of the spinal fluid. The puncture usually is performed at the fourth lumbar interspace and, before any of the fluid is removed, the intraspinal pressure is taken by Ayer's water manometer, which should register approximately from 12 to 15 cm. As soon as this has been ascertained, Queckenstedt's test is made, which consists of reading and studying the rate of rise of the cerebrospinal fluid in the manometer following compression of both internal jugular veins. Sudden rise and rapid fall of the fluid on compression of both internal jugular veins indicates the free flow of cerebrospinal fluid in the subarachnoid space. Slow rise and fall of cerebrospinal fluid, or its failure to rise on compression of the jugular vein, suggests partial or complete intraspinal block. A dry tap at the fourth lumbar interspace suggests that the needle has failed to enter the spinal canal, that cerebrospinal fluid is absent, or that the needle has entered a tumor situated opposite the puncture. This indicates that other attempts should be made at higher or lower levels. If spinal block is not encountered, as, for example, in the third or second lumbar interspace, it is wise to attempt an additional puncture at the fifth lumbar interspace, since one then may be able to demonstrate if spinal block exists between the two punctures. Occasionally cisternal puncture, in conjunction with lumbar puncture, supplies sufficient information concerning intraspinal pressure to warrant the procedure. Spinal punctures are not particularly difficult or painful, and can readily be made less painful by the preliminary use of morphine. Headaches occasionally follow a puncture, but usually can be alleviated by hospitalization, and by requiring the patient to lie flat in bed for twenty-four hours.

Spinal block, if due to tumor, frequently causes increase in the globulin content of the cerebrospinal fluid below the tumor. The fluid may be xanthochromic (Froin's syndrome). In a few instances, the fluid above the tumor has been xanthochromic. The cell count is usually normal,

but may be increased if the tumor is situated in the spinal canal below the conus. Blood is rarely demonstrated in the spinal fluid unless veins are injured or a tumor has been punctured. Before withdrawing the needle, after having withdrawn from 7 to 10 c.c. of cerebrospinal fluid, the pressures of spinal fluid are again recorded, since, with the withdrawal of the fluid below, a tumor above the puncture which may only partially block the spinal canal results in a lower reading than would ordinarily be obtained if block did not exist.

The presence of partial or total block is not pathognomonic of intraspinal tumor, since previous attacks of meningitis, acute myelitis, injuries to the vertebrae or deformities of the spine are all capable of interfering with free flow of the cerebrospinal fluid. But it is apparent that such conditions are extremely valuable when found in conjunction with the history of root pain, without a history of meningitis, acute myelitis, or trauma.

Roentgenographic Examinations—In cases of root pain and in those in which histories are suggestive of tumors of the spinal cord, anteroposterior and lateral roentgenograms should be made. Camp and I have demonstrated that there is frequent roentgenographic evidence in cases of intraspinal tumors. The psammomas may contain sufficient calcium to cast roentgenographic shadows. They are also capable of producing erosion of the pedicles and laminae. The neurofibroma may erode the pedicles and cause further destruction of the transverse processes, laminae, and bodies by growing through the intravertebral foramina. Although the tumors are situated opposite the thoracic vertebrae, they may erode the ribs and cast intrathoracic shadows. The large, ependymal-cell gliomas of the filum terminale are capable of producing erosion of the bodies of the vertebrae on each side of the intravertebral disks and the median raphé, besides eroding the laminae and pedicles on their dorsal and lateral aspects. The hemangiomas have a tendency to produce proliferations of bone which result in the increase of the spines and laminae. Angiomas of the vertebrae produce characteristic trabeculations, with punched out areas. Hemangio-endotheliomas situated extradurally likewise produce circumscribed erosions of the laminae, pedicles and vertebrae. Chordomas present characteristic destructive changes of the sacrum which are diagnostic in appearance. The proliferative changes of the vertebrae, pedicles, laminae and spines which result in compression of the spinal cord and the production of symptoms similar to those produced by intraspinal tumors, are readily recognized on roentgenographic examinations and offer valuable diagnostic assistance. Fibrochondromas and foreign body giant cell tumors are readily recognized roentgenographically, as are spinous processes and overhanging proliferative ridges in the vicinity of the intravertebral foramina; occasionally the services of a neurologic surgeon are required to relieve compression of the cord and nerve.

Radiopaque Oils—Fluoroscopic and roentgenographic study by the use of radiopaque oils has furnished much additional information in the diagnosis and localization of intraspinal tumors. Introduction of these oils invariably produces chemical meningitis and occasionally radiculitis, so that they must be used only when there is no definite evidence of the diagnosis and localization of the tumor. It is true that if the oil is employed in cases in which there is complete spinal block, the roentgenogram will reveal the exact situation. As the oil may pass the tumor and lodge in the lower portion of the caudal sac, it often fails to demonstrate the exact situation when the block is incomplete. Hence, fluoroscopic examination with the slowly moving oil is superior to roentgenographic examination, since the observer is often able to see the diversion of the current oil around a tumor, and in case of an intramedullary tumor he can see the flow of oil split in two currents, flowing one on each side of the cord. In cases of chronic meningitis he is able to see the oil flow from one pool to the other as if it were caught by bands of adhesions. It is best to use the heavier oils, and thus to avoid ascent of the oil into the cisterns and into the ventricles of the brain. Introduction of the oil through cisternal puncture affords the easiest method of study, for the oil can be observed as it flows downward, but occasionally it may enter the posterior cistern and become lodged anterior to the medulla and pons, and fail to descend. Therefore, it is customary to introduce 4 c.c. of radiopaque oil into the lumbar space through a spinal puncture needle, after an equal volume of cerebrospinal fluid has been removed. The patient is immediately taken to the radiologic laboratory and placed on a table which permits fluoroscopic study in various positions from the horizontal to the perpendicular, as the observer may wish to direct the flow of oil first in one direction and then in another. The oil finally disseminates into the tissues about the spine, along the nerve roots, but one year after its introduction a sufficient amount of oil may be dislodged

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Syphilis of the Ear, Nose and Throat*

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SYPHILIS, like the poor, we have always with us. It hardly seems necessary to call attention to this so common infection, but from the recital of the five cases which I will sketch briefly, we may see that we are not always as awake to possibilities as we might be. It is not at all my intention to give a complete review of all luetic lesions which we may meet in our care of diseases of the ear, nose and throat, but the fact that these cases were undiagnosed for periods of a few weeks to many months seemed to warrant calling attention to some of the lesions encountered.

Case I: Woman, age 37, who complained of sore throat, hoarseness, marked difficulty in swallowing and opening the mouth, loss of appetite, loss of weight and severe pains in the "stomach." The history of sore throat began a little over six months before the present examination. She consulted a physician who said she had bad tonsils and advised a tonsillectomy. This was done but the soreness persisted, and became worse. After four months, her physician said that part of her tonsils had grown back and that he would be glad to remove them without cost. This also was done.

After this the condition became much worse, with increasing discomfort in swallowing, loss of weight and strength and upper abdominal pain. She then went to a clinic where she was given a tonic, but no other treatment.

When she came to me for examination, it was with the greatest difficulty that her throat was visualized at all. One could see, after many attempts, with a laryngeal mirror, marked induration of the post pharyngeal wall, extending downward and involving the arytenoid on the left side, as well as the epiglottis. A large round punched out ulcer showed on the left side.

Blood Wassermann was ++++, and specific treatment was magic in its effect on the throat in one week's time. Fortunately, the squellae were very minor, being confined to an irregularity in the epiglottis and a cicatricial contraction on the left side which did not interfere with the functions of swallowing, speech or breathing.

Case II: Woman, 34, history of sore throat, headaches, large amount of postnasal discharge, pain in the chest, cheeks and ears, especially the left, for a period of about seven months. Treatment by her physician during this time consisted of painting the throat, gargles and nasal sprays, with ever increasing severity of symptoms.

Examination showed ulceration over the posterior half of the inferior turbinate on the left, over the upper part of the soft palate, extending down over the back of the uvula, and a very ragged, "motheaten" ulceration of both tonsils. Blood Wassermann ++++.

Case III: Woman, age 28, complaining of pain in the right frontal region for the past five or six weeks, worse in the evening and early in the morning, and wearing off usually during the day. Patient had a head cold about seven months, and another about five months, ago, each lasting about a week. A small area over the right frontal region has been tender to the touch for five weeks. She had had irrigation of the maxillary antrum on the right side, treatment with external heat, and had been advised to have a submucous resection of the nasal septum which was quite thick in the upper portion. X-rays had been taken and reported in part as follows: "There is evidence of involvement of the right frontal sinus. This has the appearance of quite marked thickened mucous membrane." A later report says, "Stereoscopic plates were made of the frontal bone. These show no evidence of fracture, dislocation or bony injury. Conclusions: Normal condition of the frontal bone. Involvement of the right frontal sinus with definite thickened mucous membrane."

Examination showed a small, fairly firm elevation near the frontal midline about five centimeters above the orbital margin. This was very tender to the touch. Transillumination of frontal and maxillary sinuses was clear. A diagnosis of periostitis was made and a blood Wassermann done, which was returned strongly positive.

Case IV. Woman, age 41, seen October 27th, who in March had had some swelling of the upper lip. She consulted a dentist who said that there was a "pus-bag on one tooth." In June she noticed a swelling over the right side of the nose which had persisted, sometimes increasing to involve the cheek and even the eyelids on that side. There was no pain until recently when she had had pain back of the ear and into the neck on the

*Presented by invitation before the Central Wisconsin Eye, Ear, Nose and Throat Society at Wisconsin Rapids, Wis., May 15, 1933.

right side. The right side of the nose had been obstructed, with production of a watery secretion at times. There has been no heavy discharge from the nose and no bleeding. There has been no temperature increase, no weight loss and the appetite has been good. In August two teeth were extracted. She had consulted three physicians, had had irrigation of the right maxillary sinus, sprays and drops for the nose, and had been advised to have a radical operation a few days before.

Examination showed a fullness on the right side of the nose, with a moderate amount of edema extending over the upper cheek and involving the lower eyelid. Palpation of the skin lesion over the nose showed it to be a rather brawny induration with fairly well demarcated borders. It was not tender. Inspection of the nares showed very markedly swollen right inferior and middle turbinates which were quite firm to the touch and which were not affected to any great degree by the action of adrenalin on cotton pledgets. The floor of the naris showed a like condition. There was no evidence of pus in the nose or the nasopharynx. Transillumination of the frontals and left maxillary was clear but the right seemed quite dark. X-ray examination gave the following findings: "Stereoscopic roentgenograms made in the Waters, Caldwell, oblique and lateral positions show the detail of the nasal accessory sinuses.

"The left frontal sinus is moderate in size and depth and normally ventilated. The right frontal sinus is quite small and its ventilation is diminished. The ethmoidal sinus on the left side is normally ventilated and on the right side there is diminished ventilation of the ethmoidal sinus, and as viewed in the oblique direction, there appears to be complete absence of ventilation of the anterior ethmoid cells and fairly good ventilation of the posterior ethmoidal cells.

"The left maxillary sinus is apparently normal. There is complete absence of ventilation of the right maxillary sinus.

"The sphenoidal sinuses are moderate in size and are apparently normally ventilated.

"The medial wall of the right maxillary sinus is thickened. The bone in this wall is apparently also thickened but has definitely a worm eaten appearance. This change extends up to the lateral part of the nasal bone.

"Diagnosis: From the study of these roentgenograms there is evidence of a lesion involving the maxillary, frontal, and anterior ethmoidal sinuses on the right side and the bone forming the medial wall of the right maxillary sinus. The changes in the sinuses are at least in part an inflammatory change. I feel also these changes of the medial wall of the right maxillary sinus are more compatible with an inflammatory process than a new growth."

A dermatologist was consulted for help in diagnosis of the skin involvement, which did not seem to have any direct bearing on the question of sinus disease. He said the lesion was one which might be called a localized elephantiasis, a lymph stasis. The blood Wassermann was negative on first examination. After a provocative, however, it was returned strongly positive. The skin lesion, the absence of the usual history of sinus disease, the absence of purulent discharge from the nose and the x-ray report of "worm-eaten appearance of the bone" all helped to stay the hand from doing radical surgery. The subsequent blood findings made it doubly gratifying that no surgery was done. The patient returned home and after four bismuth injections her physician reported that the skin lesion and the enlargement of the turbinates had disappeared.

Case V: Woman, age 33, progressive loss of hearing over a period of years. The only other complaint was that she became exhausted every day by noon. At eight years of age she had trouble with her knees and was in the hospital for several months. A short time after this had trouble with her ankles. At this time she also had inflammation in her eyes and was kept in a dark room. One sister totally deaf from childhood. A year and a half previously the patient had an acute mastoiditis which was operated. Though she was six months pregnant at the time, she carried the child to term and was delivered of a normal baby, her third child. There had been no miscarriages, one child died of a growth in the oesophagus. Six months after mastoidectomy she had a submucous resection of the nasal septum, followed by a tonsillectomy. The hearing acuity has progressively diminished although she has had repeated treatment by inflation of the Eustachian tube.

Examination showed nothing of importance except the scar over the left mastoid and a slight retraction of both eardrums. Functional tests showed that she could not hear the test watch with either ear, the acoumeter being heard at six inches with the right ear ,and seven with the left. Rinne test was positive, Schwabach decreased: there was marked diminution of perception of high tones and moderate loss of low tones. Audiometric readings confirmed the fork tests.

The clue to the diagnosis came from examination of the eyes. There was no reaction of the pupils to light and a sluggish reaction to accommodation. The right pupil was slightly larger

than the left. Vision was normal, ophthalmoscopic examination was negative and perimetric fields normal. The slitlamp showed no evidence of previous iritis.

Blood Wassermann was negative but the spinal fluid was positive to all tests, Wassermann, globulin and colloidal gold. As far as can be determined, husband and children are all free from luetic infection. It was later learned that the patient's mother had at least had a spinal puncture for diagnostic purposes, the cause of her death being uncertain, though given as "change of life."

The deafened sister had been under specific treatment over a period of years. Another sister has Argyll-Robertson pupils.

The first two cases represent an important group in tertiary syphilis, which should always be borne in mind, because of the sequallae which may be of a very severe nature, due to the cicatricial contractions of extensive lesions. Syphilitic gummata in the naso-pharynx often occur on the posterior wall as swellings of varying size. The symptoms in the first case, pain, difficulty in swallowing, and voice changes are common symptoms. Ulceration occurs, which may cover a large area. If anterior, there may be perforation through the soft palate, with changes in phonation like those of a cleft palate. There may be adhesions, even to stenosis, between the soft palate and posterior wall. If the lesion is lower, there may be loss of all or part of the epiglottis. When the lesion involves the larynx, there may be extensive destruction of soft tissues and cartilages, as well as involvement of the vocal cords, resulting in impairment or loss of voice, either from the destruction of the cords or fixation by scar tissue. There may be varying degrees of closure of the larynx by web-like sheets of connective tissue, resulting not only in loss of voice, but in interference with breathing.

Early diagnosis is the only way to prevent these grave complications, most cases responding very nicely and often spectacularly, in a very short time, to the exhibition of specific treatment.

The next two cases are representative of syphilitic involvement of the cranium.

Stokes says that of all skeletal syphilis, cranial and nasopalatine lesions are given as 42 per cent, remarking that this figure may be due only to the relatively easier diagnosis in this region. He also states that periostitis stands out as the commonest lesion of the osseous system due to syphilis, comprising 53 per cent of the whole.

Pain, swelling and tenderness are the chief early symptoms of periostitis, the pain often being nocturnal as in all bone lesions. While we are all aware of the lesions of the long bones, particularly of the tibia, we must not forget that any part of the skeleton including the skull, may be involved.

The early lesion of periostitis is a rather doughy, non-inflammatory swelling, tender to the touch. The x-ray in this stage is negative as in our case. Later the lesion becomes firmer, perhaps nodular, with the tender point less marked and much less sensitive than the early lesion. X-ray may now show changes such as thickening of the periosteum, with formation of irregular subperiosteal bone.

It is important to remember that in the long bones syphilis is usually a constructive, osteoplastic process while in the cranium it is a destructive, osteoporotic one. Here good roentgenograms are of extreme importance. Gross lesions of a destructive nature would be shown in most plates, but I am of the opinion that good stereoscopic films are almost essential for the finer interpretation of earlier and lesser changes in the skull, of which we are particularly interested in the nose and its accessory sinuses. Too much emphasis cannot be placed on the finding quoted in the x-ray report on case IV, of a "worm-eaten appearance." In the cranium generally, this appearance, or sharply defined areas of necrosis with no evidence of regenerative or productive processes is quite typical. "Always think of syphilis in typical cases of chronic accessory sinus empyema, especially where there is a bone destruction." (Hajek.)

Little is said in most textbooks about luetic involvement of the sinuses. Skillern says "Maxillary sinus empyema as a result of syphilitic infection can occur only through necrosis of some portion of the bony wall through dissolution of a tertiary lesion. The nasal wall beneath the inferior turbinate and the anterior wall have been reported thus affected but the process is rare enough, as the extreme paucity of the reported cases will substantiate."

Hajek in his book says, "It is more than doubtful whether suppuration of an accessory sinus, especially of the frontal sinus, can be caused by syphilis without a previous gummatous disease of the walls of the sinus." Where this process has gone on to necrosis, secondary infection has taken place, and we have suppuration, it is obviously more difficult to make a diagnosis without careful study.

Detailed history, examination for other evidences of lues, serological examinations and x-ray are all important. Stokes, again in his book "Modern Clinical Syphilology," summarizes it thus: "From the general diagnostic considerations there emerge then, the blood Wassermann reac-

tion, the x-ray plate and the correct interpretation of cutaneous lesions and scars as the chief collateral aids in the diagnosis of syphilis of the skeletal system in our experience."

The last case is an interesting and instructive one from many standpoints. We have apparently a case of congenital or heredo-syphilis in which no frank symptoms developed until the patient was well along in adult life, though the joint inflammations and eye involvement when she was eight may well have been manifestations of her luetic infection. Our patient had grown up, married and had a fine little family. The stigmata of congenital lues were entirely absent aside from the eighth nerve lesion.

We know that the Hutchinsonian triad is seldom found in its complete form but when we find any one of the three we should be on our guard. We would probably think immediately of congenital syphilis if we found Hutchinson teeth or interstitial keratitis, but not perhaps so surely in the case of developing nerve deafness, especially on finding a negative blood Wassermann.

The blood Wassermann here was negative. We all depend, perhaps, too much on this finding. When there is a question of involvement of the central nervous system, manifest either in the organs of sight or hearing, in our fields, the patient should have further study on the reactions of the spinal fluid. While eye lesions as a group constitute by far the greatest percentage of all lesions found in heredo-syphilis, deafness is found in about ten per cent. Again it is seen that an exhaustive study to rule out syphilis in children who show a nerve-type deafness, even though there are no other signs of syphilis, is extremely important.

As in acquired syphilis, so in the congenital cases, it is not so much the finding of hearing loss that is most important, but the fact that often this signifies invasion of the central nervous system which may lead to much more dire results than deafness. Tabes, paresis, meningitis, encephalitis, cerebral arteritis and their combinations, as well as epilepsy and imbecility develop in a large percentage of patients with hereditary syphilis. (Roughly 25 per cent.) The heredo-syphilitic child with an eighth nerve deafness does not respond in any appreciable degree to treatment, as does the patient with acquired neuro-syphilis. Premonitory symptoms of tinnitus and vertigo, with or without nausea and vomiting, should make us check carefully for syphilis, and institute treatment early when it is present.

I do not intend to outline any treatment, for I do not feel qualified as a syphilologist, and have not treated any of these patients for their lues as such. My good friends, who treat syphilis as a specialty, seem to have their own pet therapeutic measures, which however may be summarized in a few words. Of first importance is systematic, adequate and prolonged treatment. The drugs used simmer down to bismuth, mercurials, in rubs and by injection, arsenicals and in some cases, iodides. Fever treatment, notably by infection with malaria, as developed by Wagner-Jauregg, is being used more and more in the treatment of neurosyphilis. There is no good reason, perhaps, why we should not treat our own syphilitic patients, and probably some of you do. The only warning necessary, I think, is of the danger of a Herxheimer reaction, in which case there may be a severe exaggeration of the focal symptoms. In the case of laryngeal involvement, the consequent reaction in the tissues, with edema, may cause asphyxiation if immediate help is not at hand. In eighth nerve involvement, a therapeutic shock may result in abrupt total and irremediable deafness. Such patients should be prepared with mercury or bismuth before using arsenicals. Extreme caution should be exercised when there is any involvement of the optic nerve, especially if tryparsamid is used in treatment.

In all of these cases, there was enough suspicion aroused by the lesions presented, to have serological studies made. From my study of the literature, it would seem that this valuable adjunct is not utilized generally as it should be. Stokes makes the statement that in the cases of skeletal syphilis, coming to the clinic, while 24 per cent had had Wassermann tests taken, 82 per cent were found positive, which makes him remark that the profession at large had failed to use nearly 60 per cent of the advantage it might have had in the diagnosis of these cases.

In the first three of our cases the blood was positive, on first examination. In the fourth, one provocative treatment rendered a negative Wassermann, positive. In none of these had a blood examination been made. In the fifth case, while the blood was negative, the spinal fluid was positive. I would strongly urge greater use of the spinal fluid tests, in any questionable case. With symptoms of headache, blurred vision, tinnitus, vertigo, with or without nausea and vomiting, nerve deafness, all or singly or in any combination, unless the cause is manifest, an attempt should be made to eliminate lues as the possible etiology, first by blood test, and that failing, by spinal fluid examination. Without going into the question of when a positive reaction really means

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The Management of Pulmonary Tuberculosis in the College Age Period*

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EVERY physician in the practice of medicine, whether he devotes his time to general practice or any one of the numerous specialties, sooner or later must deal with the tuberculous patient. Most every physician has, in his clientele, girls and boys of college age. From the standpoint of health, this is a crucial period in the lifetime of the individual and this is particularly true of tuberculosis. While the material presented in this paper deals with university students, the problem of management does not differ from that of the practicing physician in cases of tuberculosis in this age period.

The management of tuberculous students still constitutes a problem for every college and university. First, it involves a careful inventory by means of the tuberculin test to determine just which students have foci of tubercle bacilli in their bodies. Second, a careful physical and X-Ray examination to determine location, extent and type of tuberculosis, so as to be able to classify the students into groups. Third, conveying the facts concerning tuberculosis as they apply to each case and recommending and administering treatment as indicated. Occasionally one hears the statement that there is no tuberculosis problem among the students of certain colleges. The statement usually is based upon the fact that no student has recently fallen ill or become a frank consumptive on the campus. In reality, as long as there is a single student who reacts positively to the tuberculin test there is a potential tuberculosis problem on the campus.

Our greatest difficulty at present is that there has been a wide range of difference in the interpretation of the term "tuberculous." In the human family it has usually had reference only to ill persons or persons who had lesions sufficiently large to be easily demonstrated by physical or X-Ray examination. The difference in interpretation has also extented to the veterinarians. For example, in England in 1913 an order was sent out from the Minister of Health to the effect that all tuberculous cattle should be slaughtered. Only those animals obviously ill, and those with tuberculosis of the udder were considered tuberculous. Therefore, only this group was slaughtered. Those in the fields, often the sleekest and healthiest appearing animals but which were positive reactors to the tuberculin test, were not considered tuberculous. In short, the work in England was confined to the last chapter of tuberculosis, no attention being paid to the first or any of the intervening chapters. In 1932, the Peoples' Health League of England was convinced that there was still a large tuberculosis problem among the cattle of that nation. Following an investigation, their report showed that approximately 40 per cent of all of England's cattle were contaminated with tubercle bacilli. It is doubtful, therefore, whether the situation in 1932 was much or any better than that in 1913, all because of the strict interpretation of the term, "tuberculous."

About 1915, laws were enacted in the United States which provided for the slaughter of tuberculous cattle. Here, however, the interpretation of the term "tuberculous" was much broader than that in England. This included not only those animals definitely ill from tuberculosis but also the positive reactors in the field, no matter how sleek, how healthy, or how valuable. The veterinarians of this country knew that if the disease was ever to be eradicated they must start with the very beginning. They were convinced of the specificity of the tuberculin test, although they were cognizant of its shortcomings. They looked upon every apparently healthy animal reacting positively to the test as a potential reservoir of tubercle bacilli. They were certain that in the body of each of these animals there were foci of tubercle bacilli. Inasmuch as they had no test or phase of the examination which would determine with any degree of certainty which of these apparently healthy animals would later fall ill from tuberculosis and disseminate tubercle bacilli, they provided for the slaughter of positive reactors, thus leaving in the field only those free from contamination, as evidenced by the negative tuberculin test.

In the political divisions of the United States where such laws have been in effect, tuberculosis among the cattle has been reduced from a high

*Read before the fourteenth annual meeting of the American Student Health Association, Chicago, Ill., December 28, 1933.

Prepared with the aid of a grant from the Research Fund of the University of Minnesota.

From the Departments of Preventive Medicine and Internal Medicine and the Students' Health Service of the University of Minnesota.

percentage in the beginning of the campaign to five-tenths of one per cent or less in 1933. This applies to thirteen whole states and approximately 50 per cent of all the counties of the entire United States, and it appears that it will soon apply to the entire nation. Moreover, it extends to Canada, where remarkable success has followed the tuberculosis program. Today it is obvious that the veterinarians of these countries had clear vision and their method of attack was ideal.

Someone says the control of tuberculosis among animals is simple, since all positive reactors as well as ill animals are slaughtered, but that the problem of tuberculosis in the human family can not be solved in this manner. The answer to such an argument is that we are able to substitute for slaughter, instruction in the prevention of the disease, isolation in the homes and institutions of the spreaders of tubercle bacilli, and treatment, particularly by collapse therapy, of large numbers of tuberculous patients, so as to bring their lesions under control. These are almost as effective, when properly applied, as the veterinarian's method of slaughtering the animals. It is true that the time requirement is longer but eventually this method should lead to the same goal. Already the incidence of positive reactors in the human family has definitely decreased.

In human medicine, we have interpreted the term "tuberculous" just as the veterinarians of England did, and we have applied it only to persons ill from tuberculosis. We have taken almost no cognizance of those who reacted positively to the tuberculin test but who appeared to be in perfect health. We have not considered them as potential reservoirs of tubercle bacilli, and until recently, we apparently did not realize that they provided the subsequent tuberculosis load of the community. Already in some parts of the country we have copied area testing of human beings from the veterinarian's area testing of cattle. It is now time that we copy his interpretation of the term "tuberculous."

The first step in making a tuberculosis inventory in any institution of learning consists of administering the tuberculin test. Each student who reacts positively should have further clinical examination to determine where to classify him. Inasmuch as there is a short period of time after the body becomes infected with tubercle bacilli before allergy makes its appearance and inasmuch as students may become contaminated with tubercle bacilli during the period of their university course, all who react negatively to the test on admission to a school should have periodic tuberculin tests while they are in the institution. These tests should be performed at least every year. Although most persons do not fall ill from first infection with tubercle bacilli, all recent positive reactors should be under observation and receive instruction similar to that which is given to those who react positively on admission to the school.

In the fall of the school year, 1931-32, 2,672 students entering the University of Minnesota were given a tuberculin test consisting of one-hundredth milligram of Old Tuberculin. Of this number, 834, or 31.2 per cent, reacted positively. In the fall of the school year, 1932-33, 2,687 entering students were given one-hundredth milligram of Old Tuberculin. Of this group 671, or 24.9 per cent, reacted positively. It appears, therefore, that the incidence of positive reactors is decreasing, inasmuch as when the routine tuberculin testing began in 1928, 33.4 per cent reacted positively. In 1928 the Pirquet test was used, which is comparable in its reaction to one-hundredth milligram intracutaneously.

The subsequent findings in this group of cases will be reported in some detail elsewhere; therefore, cases included here are only those who were seen in the special chest clinic at the Students' Health Service from the fall of 1931 until the fall of 1933. During this time, 777 students reported for special examination, of whom 406 were men and 371 were women. Their ages ranged between fifteen and fifty-eight years, the majority being between eighteen and twenty-four years, and most of them were positive tuberculin reactors. However, the work of the clinic is not confined to tuberculosis and, therefore, other conditions are sought and reported. Table I shows them grouped according to the findings on examination. The diagnosis was undetermined in six cases on the last examination. In seventy-eight cases, the physical and X-Ray film examination was essentially negative. This figure is much smaller than it has been in the previous years. Primarily this is due to a more careful weeding of material before it reaches our clinic; secondarily, it is due to the more thorough application of the X-Ray in the examination, so that negative physical findings are no longer accepted as the sole criterion of a normal chest. There will always be a number of students who, because of symptoms, such as chronic or recurrent cough, dyspnea, chest pain or past history (many students come in for examination because they have been told they have "weak lungs") or exposure to tuberculosis merit thorough chest examinations, and even repeated chest examinations, even though these prove apparently negative. The importance of watching essentially negative chests when there are definite

complaints, or definite histories of repeated exposure, cannot be minimized. The following cases bring this out clearly.

A junior student, aged forty-nine, in the School of Medicine, had always been in good health except for an occasional attack of influenza. In January, 1931, the tuberculin test was positive and the X-Ray film showed no evidence of the disease. In February, 1932, the X-Ray film was still clear. However, in February, 1933, there was evidence of pulmonary tuberculosis involving both upper lobes, more marked on the left side.

A girl in the School of Science, Literature and Arts, aged twenty years, who had always been in good health, had an X-Ray film examination made in March, 1931, which showed no evidence of disease. Unfortunately, the tuberculin test was not administered at that time. However, in 1933, the test was found to be positive. In May, 1933, the X-Ray films revealed tuberculosis in a moderately advanced stage involving both lungs.

A girl of twenty-one years, who was enrolled in the course in Dental Hygiene, had an X-Ray film of her chest, which was negative in October, 1931. At that time the tuberculin test was refused. However, in 1933, she complained of cough and expectoration and occasional pain in her left chest. These symptoms were present for approximately a week before an X-Ray film was made. This showed definite evidence of tuberculosis, particularly marked in the left lung, where cavitation was already present.

In schools where students are greatly exposed to patients suffering from tuberculosis, we have frequently seen those negative to the tuberculin test and with negative X-Ray films later develop positive tuberculin reactions and still later, evidence of disease on the X-Ray films. In fact, under our observations we have seen various changes in previously negative chests, from the apparently innocuous, mild, dry pleurisy, the simple increase in lung markings, the formation of calcified nodules, etc., to the destructive type of disease. The diagnosis of "essentially negative" can, therefore, never be accepted as final.

We are cognizant of the fact that the tuberculin test occasionally fails. However, periodic retesting of the negative reactors will usually bring to light the cases in whom the test failed on first examination. Dorset has recently shown that the tuberculin he has produced by growing tubercle bacilli on synthetic media is even more specific than the tuberculin we have previously used.

Refinements in diagnosis have pushed back the curtain so that we no longer need to wait for illness to appear. When the tuberculin test, which is the first step in any examination for tuberculosis, becomes positive, foci are present which if placed under the microscope the pathologist would designate as areas of tuberculosis. Many clinicians prefer to consider this stage as one of infection with no evidence of disease, just as England did with her cattle.

While it is true that the tuberculous foci which cause the body to react positively to the tuberculin test for the first time rarely result in illness or disability immediately, it is also true that they mark the beginning of an experience with tuberculosis which may become calm and tranquil or it may become stormy and hazardous. There is some evidence which leads to the belief that 10 per cent of the positive tuberculin reactors at some subsequent time in life have a stormy course. Hill estimates that this is true of approximately 20 per cent. Inasmuch as we have no way of determining which of the positive reactors will later fall ill, the only safe procedure is to keep all of them under observation. Therefore, we recommend the use of X-Ray films for every positive reactor.

This entails considerable work and can be carried out by the Health Service only while the student is registered in the institution. However, during this period he can be informed of the potential danger and advised to continue to have periodic examinations, including X-Ray films, by a well qualified physician. Moreover, follow-up surveys through the Health Service by the family physician would result in the accumulation of valuable data and encourage periodic examinations. Someone says that such observation on students with no evidence of tuberculosis except the positive tuberculin reaction is costly and impractical. This is what the veterinarians of England said about cattle.

We are thoroughly cognizant of the fact that the X-Ray film is a very coarse screen and brings to light only a small percentage of the lesions of the first infection type. However, when they are detected they may be in various stages of development. In our group of 777 students, there was some evidence of the first infection type of disease in thirty-eight, but the evidence was not sufficient to make certain that we had actually located the primary foci. In 254 students, however, there was definite evidence on the X-Ray film of Ghon tubercle formation, calcium deposits in the lung hilum region, etc. Such cases usually do not require special treatment but like those with only positive tuberculin reactions, they should be taught, insofar as possible, to prevent further contamination with tubercle bacilli and to have periodic examinations, including X-Ray films, not

only during their stay in the university but after graduation. Such cases usually do not have tubercle bacilli in the sputa. However, several workers have found bacilli in the gastric contents of children with the same types of lesions, particularly when they are in the inflammatory stage. In our experience with students, we have not found that they become alarmed or neurotic when we tell them the facts concerning a positive reaction or the finding of the first infection type of tuberculosis, but they do become deeply interested, ask many questions, and often express their thanks for the information which we believe will aid them in preventing disaster in later life.

There were ten cases of pleural effusion and 133 cases with evidence of pleural thickenings, adhesions, etc., in our present group. When a student with a positive tuberculin reaction gives a history of pleurisy with effusion not adequately explained on a non-tuberculous basis, or when a student reacting positively shows evidence of pleural adhesions or thickened pleura on the physical or X-Ray examination, he should also be kept under very careful observation and should have the fact explained to him that not all such pleurisies are tuberculous and that since there is no way of determining whether his was due to tuberculosis, he should be examined periodically throughout life.

The following case is a good example: This girl at the age of twenty-four years was a student in a small college when she developed pleurisy with effusion in 1929. She was sent to a sanatorium, where she received excellent care. When the fluid had compeltely absorbed, no tuberculous lesion could be detected in either lung. In September, 1931, she entered the University of Minnesota, and since that time has been very conscientious in reporting for periodic examinations. The X-Ray films were entirely clear until the fall of 1933, when a lesion in the right upper lobe had become sufficiently large to cast a shadow which could be visualized by the naked eye. We are strongly of the opinion that this is a reinfection and destructive type of tuberculosis which doubtless has been present for a long time without being detected by our present methods of examination. From this time on, the periodic X-Ray film examination will be of great value in determining progression of the lesion and hence the necessary treatment.

Another case is that of a girl of eighteen years, who came to the Students' Health Service because of pain in her chest in 1924. At that time the only abnormal finding detected was diaphragmatic adhesions on the left side. Unfortunately, such cases were not given very serious consideration at that time, and there was very little follow-up work. She later graduated and in the fall of 1933 was enrolled in the Graduate School. One day she developed a pain in the right lower axilla, which caused her to report for examination. The physician who examined her elicited friction rubs over this area, but the X-Ray film revealed a rather extensive shadow in the right upper lobe representing a tuberculous lesion. Unfortunately, the lung had become adherent to the chest wall; therefore, artificial pneumothorax could not be administered successfully. There can be no doubt that this girl's tuberculous lesion would have been detected much earlier if she had had periodic examinations, including X-Ray films, since the first time we saw her in 1924.

Some authors have estimated that at least 15 per cent of the cases of pleurisy with effusion later develop destructive types of parenchymal lesions. One must not expect to see large numbers of students with positive tuberculin reactions alone or those with the first infection types of lesions demonstrable by X-Ray or those with pleural adhesions or history of pleural effusions break down with tuberculosis during their university course; their stay in the institution is too short. However, all should be warned against future dangers and assured that usually treatment may be successfully administered if clinical disease is detected before it becomes extensive.

Spontaneous pneumothorax was observed in five cases, none of whom had clinical tuberculosis. They have been included in a larger group discussed elsewhere.

Those students who have on admission or develop during residence tuberculous lesions of the reinfection type constitute problems which require very careful consideration. One must be mindful of the harm which may come to the student by recommending too much or too little treatment. In the early days of our work, we recommended such drastic treatment as to do injustice to many of them; that is, we recommended hospitalization for nearly every student whose X-Ray film showed parenchymal shadows. We did not take into consideration the possibility of such shadows having been present to the same extent for many years without having caused any symptoms, nor to the fact that such shadows may remain throughout the life of the individual without causing illness.

In our present group, Table I, fifty-one cases had very slight X-Ray changes, sufficient, however, to classify them as probably minimal tuberculosis. Unless there have been periodic tubercu-

TABLE I

Diagnosis	Male	Female	Total
Negative	30	48	78
Diagnosis undetermined	2	4	6
Bronchitis, chronic	10	12	22
Bronchiectasis	7	6	13
Pleurisy with effusion	2	8	10
Empyema, healed	7	3	10
Pleurisy, chronic fibrinous	78	55	133
Pneumonia	6	6	12
Pneumothorax, spontaneous	5	..	5
Tuberculosis, probable first infection type	24	14	38
Tuberculosis, first infection type (childhood)	140	114	254
Tuberculosis, probable re-infection type	29	22	51
Tuberculosis, re-infection type, minimal	39	49	88
Tuberculosis, re-infection type, moderately advanced	16	21	37
Tuberculosis, re-infection type, far advanced	2	5	7
Pulmonary emphysema	3	1	4
Tuberculous spine, healed	..	2	2
Tuberculosis, renal	1	1	2
Tuberculosis, peritoneal	1	..	1
Kyphosis (etiology undetermined)	1	..	1
Eventration of diaphragm	1	..	1
Bullet wound of chest	1	..	1
Cardiac lesion	1	..	1
Total	406	371	777

lin tests in such cases, it is impossible to determine whether such shadow is due to the first infection or the reinfection type of tuberculosis. The location of the lesion is by no means an adequate criterion for such a determination. Moreover, such shadows very frequently prove to be of no apparent significance and disappear in a short time, if they are due to acute non-tuberculous infections. Nevertheless, such cases should be kept under close observation, since the occasional one does prove to be a reinfection progressive type of tuberculosis. In eighty-eight cases there was sufficient evidence to justify the diagnosis of reinfection type of pulmonary disease in the minimal stage, thirty-seven with moderately advanced disease, and seven in the far advanced stage.

We now study all lesions very carefully. If they are not extensive and there is no evidence of cavities or recent progression of the disease, and there is no sputum, the student is placed on a period of observation during which time he remains in school and reports periodically to check his general health, have new X-Ray films made, etc. In such cases the greatest aid obtained from the X-Ray is through serial films. A single X-Ray examination may be very misleading.

For example: A university student came to us for examination because she had recently been examined by a physician who in addition to the physical examination sees only the roentgenologist's report. This physician sent the student to a roentgenologist who reported tuberculosis involving the right upper lobe. The physician immediately insisted that this girl enter a sanatorium for a long period of treatment. Upon taking the history, we found that the duration of her symptoms was short; the onset was acute. When we first saw her the symptoms had completely disappeared and the X-Ray film of the chest showed no evidence of abnormal shadow. After consultation with the previous physician and roentgenologist and comparison of findings, we all agreed that this student had a small area of pneumonia in the right upper lobe, which had completely resolved. A rather serious injustice may be done such students unless a period of observation is provided during which time examinations are made, including X-Ray films.

Another case is that of a girl who entered the University of Minnesota in the fall of 1933. The tuberculin test was positive but the roentgenologist's report was "probably normal chest." However, the girl had given a history of having had a diagnosis of pulmonary tuberculosis in August, 1932, and having been on strict bed rest treatment for several months. We asked for the films made by her previous physician, which showed very definite evidence of tuberculosis infiltration in the left upper lobe. Serial films showed a very slow but definite disappearance of shadow until, by the time she reached us, the X-Ray film was clear. A very definite injustice would have been done her former physician if she had been told that no tuberculosis existed. The fact that the present X-Ray film does not show any shadow does not mean that the disease has entirely disappeared and that reactivation in the same area is not possible at any subsequent time.

Another case is that of a girl who entered the university in the fall of 1933. Her tuberculin test was positive and the X-Ray film showed evidence of disease in the left upper lobe. History, however, revealed the fact that this lesion had been treated from 1928 to 1931 and her physician who knew more about her case than we did had recommended that she enter a professional school. Therefore, when students first come to us with lesions of the reinfected type demonstrated by X-Ray film examination, we must be extremely cautious not to do them injustice by recommending drastic treatment on the one hand or by being too liberal and recommending no observation on the other. Unfortunately, our methods of examination are too crude to determine with a high degree of certainty just what is occurring in a tuberculous lesion in many cases. Therefore, every such case deserves careful clinical observation.

When the first examination reveals an extensive lesion, cavitation, or tubercle bacilli in the sputum or when observation proves a minimal lesion to be progressive, there is no time to temporize; not only is the patient's health and even his life in jeopardy but other students on the

campus who come in contact with him directly or indirectly are in danger of contracting tuberculosis. If the disease is advanced and bilateral, the student should be returned to his home and family physician. If he has no physician, he should be instructed to secure one. His physician should then be provided with all the information possessed by the Health Service. It is then the physician's responsibility to determine whether his patient should be treated in the home or in an institution.

In minimal and even in some moderately advanced unilateral lesions which are progressive but are not causing serious symptoms, whether or not the sputum is positive, artificial pneumothorax may be attempted. If adhesions prevent satisfactory collapse, the student should be returned to his home and family physician.

If the lung can be satisfactorily collapsed, the student may remain in school on a modified or even the usual program. However, those to whom this treatment is administered must be very carefully selected. Although ambulatory artificial pneumothorax treatment is not new, it must not be recommended to every student who has definite indications for collapse therapy. Such factors as whether or not the lesion is acute, the patient's general condition, and his attitude toward the treatment of his disease must be given very careful consideration. Obviously the patient who has lost much weight and is toxic needs a period of strict bed rest, not with the idea of resting the diseased lung for it receives very little rest just by placing the patient in bed, but to conserve all of the energy possible and to allow him to regain his weight while the toxemia is being brought under control by collapse therapy. We are doubtful whether the student who does not seem to understand why pneumothorax is administered or who has very little regard for the necessity of treatment should be treated ambulatorily. Such students are almost always a constant source of annoyance to the physician. He knows the failure of the student to report for treatment may result in expansion of the lung and obliteration of the pleural cavity, thus removing the possibility of subsequent treatment by such a simple and effective method. Moreover, such cases may become spreaders of tubercle bacilli when the lung is allowed to re-expand.

During the past two years, we have had such a case in a student from a foreign nation. He was an ideal case for ambulatory artificial pneumothorax from the standpoint of lesion, but apparently does not understand why air should be introduced into the pleural cavity periodically. His treatment interval is now two weeks and although immediately after each treatment he makes an appointment for another treatment, two weeks later almost invariably it has been necessary to telephone, send special delivery letters, and occasionally the Dean of the school in which he is registered has found it necessary to exclude him from classes before he reported for treatment. However, we do not believe he would have remained in a hospital even though we had sent him there for treatment. Although the close follow-up work has caused us much trouble, his lung lesion should be so well controlled by the time he graduates that he will not need further treatment.

We insist upon good evidence that a minimal lesion is progressive before we recommened ambulatory artificial pneumothorax treatment. During the past two years, we have had fifteen students on ambulatory pneumothorax treatment with excellent results. At this time, all are in good general health and none has found it necessary to discontinue school work because of tuberculosis. While some of our group have been given brief periods of bed rest while artificial pneumothorax was being instituted, others have been ambulatory from the beginning and have not missed any classes.

Many educational institutions will have the occasional student who has been hospitalized and artificial pneumothorax instituted enter with the recommendation of their physicians provided their pneumothorax treatments can be continued. If the Health Service is not equipped to take care of such patients, it can insist upon the treatment being continued by outside physicians and upon close observation of the patient for the appearance of new lesions. Therefore, in the treatment of tuberculous students, no hard and fast rule can be laid down; each case must be treated individually with the idea of administering that which is safest, not only for the student's immediate future but for his entire life, and also from the standpoint of the danger to other students on the campus. The physician employed on a full-time basis to examine and treat students is just as truly a practitioner of medicine as the physician in private practice. The best criterion in each individual case is to treat the patient as he would want a member of his own family treated.

In Table II, we have combined the cases seen in our clinic during the past two years with those previously reported. Therefore, this table includes the diagnoses made during the thirteen years of existence of the Students Health Service chest clinic.

TABLE II

Negative	1,059
Diagnosis undetermined	119
Upper respiratory infections, acute	33
Bronchial asthma and hay-fever	25
Bronchitis	380
Bronchiectasis	36
Pleurisy, acute fibrinous	30
Pleurisy with effusion	30
Pleurisy suppurative	10
Empyema, healed	15
Pleurisy, chronic fibrous	268
Pneumonia	19
Pulmonary fibrosis, chronic	1
Pneumothorax, spontaneous	15
Tuberculosis, probable first infection type	38
Tuberculosis, first infection type (childhood)	337
Tuberculosis, probable re-infection type	51
Tuberculosis, re-infection type	489
Pulmonary emphysema	4
Adenitis, cervical	9
Tuberculosis of bones and joints	7
Tuberculosis of the soft palate	1
Tuberculosis, renal	4
Tuberculosis, peritoneal	2
Tuberculosis, suspected	10
Eventration of diaphragm	1
Bullet wound of chest	1
Cardiac lesion	1
Total	2,995

After thirteen years of working with this college age group, one cannot help but be impressed by the need for routine and periodic chest examinations including X-ray films for the positive reactors. University age is a crucial period in the lifetime of the individual so that neglected health or ill-advised health recommendations whether of a too drastic or too lenient nature will effect the rest of the individual's life and work. The practice of routine and periodic examinations has made possible the detection of developing disease at the earliest possible moment, often much before symptoms manifest themselves. The importance of this phase of work is self-evident. Even the general public through the educational campaign of the National Tuberculosis Association is beginning to comprehend the significance of early diagnosis in relation to ultimate recovery.

Into the consideration of every case of tuberculosis must come its two-sided nature—that is the disease as it effects the host and as it effects the host's associates. The diagnosis, observation and treatment of individual students is without doubt infinitely valuable to the students themselves, but the reverse side of the picture is that of the protection afforded the rest of the student body and the faculty. This second aide is not of less importance than the first, since we are dealing with tuberculosis, a contagious disease.

DISCUSSION OF DR. MYERS' PAPER.

Dr. H. D. Lees,
University of Pennsylvania

Dr. Myers has had a wide experience in treating tuberculosis in university students. He has called attention to the value of collapse therapy in the treatment of a large number of his cases. Since so many of our institutions are carrying on routine studies, including tuberculin test and chest X-ray, for the early detection of tuberculosis, a relatively high percentage of students found to have the disease are suitable subjects for some form of surgical collapse. We are not nearly as conservative in using this form of treatment as we were ten or fifteen years ago. Chadwick, of Detroit, reported recently that 57 per cent of cases of pulmonary tuberculosis in institutions under his supervision were treated by means of collapse therapy. Leslie, of the Michigan State Sanatorium, has reported that 77 per cent of 420 consecutive admissions were given advantage of this form of treatment. Head and his co-workers in Chicago treated 75 consecutive admissions presenting unilateral disease, by means of phrenic nerve surgery. In some of this latter series of patients, pneumothorax and other types of collapse therapy were later used. Hawes and Stone, of Boston, made a survey in six New England States to determine the percentage of cases being treated by means of collapse therapy. In this area in 1930 they found 4.2 per cent of cases of pulmonary tuberculosis were so treated. They feel that approximately 30 per cent of cases should more nearly represent the number in whom such practice should have been followed.

The two forms of treatment by collapse most commonly suited to the students that we see, are phrenic nerve surgery, crushing or removal, and pneumothorax. Phrenic nerve surgery is being employed with good results in cases presenting early lesions which are not too extensive, even though early cavitation may be present. It has now become the method of choice in a large group of such cases, where formerly pneumothorax would have been employed.

The complications, of a rather serious nature, which are at times encountered during the course of pneumothorax treatment, are met with less frequently when collapse is induced by crushing or removal of the phrenic nerve. Pleural adhesions do not develop as a result of this latter procedure, and spread of the disease to the opposite lung is less likely to occur when such collapse is instituted than when it is not. Moreover, active disease in the contralateral lung is more likely to improve and show definite clearing when the lung presenting the more extensive disease is collapsed. A case presenting a large cavity, or cavity with a thick fibrous wall, cannot be successfully treated by phrenic nerve surgery, but should be given the advantage of treatment by pneumothorax.

The Student Health Service has not met its full responsibility to the student when a diagnosis

of tuberculosis is made. If we are not equipped to carry out the proper treatment, it is our duty to refer these students to persons who are prepared to give them the advantage of the best treatment possible. Bed rest for long periods in an institution can no longer be considered as ideal or adequate as a routine procedure. Many of these students who present early, yet active processes, are enable to continue their university work without interruption when proper collapse measures are employed. Surgical collapse, in properly selected cases, represents the greatest advance that has been made in the treatment of pulmonary tuberculosis.

Personality Problems of the Modern College Girl

(*Continued from Page 460*)

and fall deeply in love with some suitable man and marry. But there are also many girls who show the strain in some of the ways I have already described: some will be shy and confused with boys, some will have repressed all feeling reactions and be indifferent to boys or have a bloodless intellectual interchange of ideas with them, some will use their association with boys for official advancement, others will use their social relations for pure excitement and pleasure-hunting. One girl may go farther and accept the current attitude that the only thing that counts between boys and girls is sex-appeal; she will put an exaggerated value on that and permit familiarities like "petting," "necking" and even sexual intercourse. Another girl may be deeply in love but again confuse this with sexuality. The finding of one man with whom she can share the depths of her being is the most important thing which can ever happen to a girl. A real relationship, whether casual, or whether deep enough to result in marriage must include contact on all of the levels: liking, respect, admiration, similarity of tastes and ideals, similar principles and integrity, finally affection and love. The kind of life which is normal for the college girl, and which really nourishes her, must have relationship as its center: and if this is so, the less essentially feminine necessities of the situation like the factual-intellectual approach to her classroom work, will take care of themselves. She ought to have warm intimate friendships with other girls, make social contacts on the basis of her own genuine feeling alone, and not for power, not for sensation, nor for information or intellectual improvement. Guided again by her spontaneous feeling, not by rational formulae, she ought to have many warm friendships with boys, and reserve her deepest love for the one man who can respond in kind.

Diagnosis and Treatment of Tumors of the Spinal Cord

(*Continued from Page 466*)

from the lower end of the caudal sac to make possible fluoroscopic examination of a thoracic intraspinal tumor. Whenever laminectomy is performed following the use of radiopaque oil, a serious effort is always made thoroughly to remove all of the oil, and to reduce the sequelae that follow its administration.

Syphilis of the Ear, Nose and Throat

(*Continued from Page 470*)

the presence of syphilis, or a negative one, its absence, even this small number of cases is evidence of the value of these tests.

The five cases presented are not unusual cases, but represent the rather typical pathological changes which are met in the practice of every otolaryngologist, and for that matter, in that of the general practitioner. If we keep syphilis in mind, fewer of our patients will go undiagnosed for long periods of time, during which grave and lasting damage is being done, not only to special organs and senses, but to the whole organization of the body.

The
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South Dakota State Medical Association
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MINNEAPOLIS, MINN., AUGUST 1, 1934

ECHOES FROM THE DULUTH MEETING

The election of Dr. W. A. Coventry to the presidency of the Minnesota State Medical Association at the meeting in Duluth, July 17th, was a well deserved recognition of his many years of untiring work in the interest of the association. He has been a councilor for the ninth district, and repeatedly served on committees that have made the Duluth meetings of the association outstandingly popular. He will take office as of January 1st, 1935, and preside at the next annual meeting which will be held in Minneapolis.

It was voted at the annual meeting to take steps to provide for an increase of the annual registration fees in order that prosecutions against violators of the basic science law might continue. This will doubtless cause some grumbling around the first of each year but, seriously now, who would not kick-in an extra dollar or two to feel that he lives in a state where the profession is being vigorously purged of impostors? The affiliate membership question was discussed at length and referred back to the component societies for further consideration until next year.

Dr. Walter L. Bierring, president of the American Medical Association, spoke on several occasions and three past presidents of that association were present and contributed to the success of the meeting. A. E. H.

MONTANA MEETING

The fifty-sixth annual meeting of the Montana State Medical Association was held in Helena, July 11th and 12th at the Placer Hotel. The Association inauguated a new innovation this year, in as much as the entire scientific program was presented by five out-of-state men—Dean Lewis, Professor of Surgery at Johns Hopkins; Tate Mason of Seattle; Julien E. Benjamin of Cincinnati; M. G. Peterman of Milwaukee, and W. A. Fansler of Minneapolis. The convention had an unusually large registration, approximately 60 per cent of the entire membership being present. Perhaps the most important event of the meeting was the signing of a contract with the National Relief body for the care of all the Montana indigent. Physicians are to be paid on a definite fee basis for all work done. Doctor L. H. Fligman of Helena, a graduate of the University of Minnesota of the class of 1901, was elected president for the coming year. Doctor E. G. Balsam of Billings was re-elected secretary for his twenty-first term in that office.

STATE MEDICINE NO BOGEY MAN

We talk about State Medicine as if it were a specter stalking in the offing; something which we may have to adopt and live with if we don't watch out. The truth of the matter is we have had some degree of State Medicine for a long time and the only real question pending is "Do we want to go further with it?"

It is very easy to prove the truth of the foregoing. Normally we have had a lot of perfectly justifiable Public Medicine. No one can find fault with the fact that the only proper way to handle the health of the Army and Navy is by its Medical Corps; the ports must be watched for yellow fever and bubonic plague, logically done by the U. S. P. H. S., communicable disease in every State and municipality is restrained by Health Departments, the health of students is maintained in schools and colleges by Health Services, the sick and wounded of the war are cared for by a Veterans' Bureau. No one objects to any of this when it is confined to its proper limits. The trouble has come when any of these smoothly running services get out of hand and then it is that we have State Medicine. The Veterans' Bureau was originally devised to clean up those who had acquired service connected disabilities and everyone was in favor of this. There was no complaint when the service was extended to care for non-service connected cases who were indigent, but when it included those who could afford to pay and even reached to the members of the Senate and House of Representatives and their families in Washington it became State Medicine. Student Health Service becomes State Medicine when it includes college faculties and their families and the employes on the campus. Public Health has become State Medicine when it establishes free clinics which are not absolutely restricted to the indigent. Municipal Hospitals are in State medicine when they furnish free care at public expense, to non-indigent people. Yes, we have a lot of State Medicine right now. There is not much farther to go to make it complete.

It is lamentable that all these things have insidiously taken root in our economic life at a time when medical organization was supposed to be at the acme of its perfection and alert to take steps to protect the interests of its component personnel. We doctors are a conservative lot, living very individualistic lives and trustfully leaving our larger interests in the hands of our professional economists and they in their stuporous smug complacency have slept on while the brain trusters in lay sociology have been concocting their schemes to corner our product.

We'd better stop worrying about the National Health Insurance and what not that is just around the corner and clean up a bit on the State Medicine which we now have.

G. C.

HAROLD SAMUEL BOQUIST, M.D.
1888-1934

Dr. Harold Samuel Boquist was born in Red Wing, Minnesota, on October 21, 1888. He attended school in several places in Minnesota, where his father was a minister. He graduated from the Wheaton, Minnesota, High School in 1907. Later, he entered the University of Minnesota and graduated from the School of Education in 1914, having been elected to membership in Phi Delta Kappa, honorary education fraternity, and Phi Beta Kappa. Being well-trained to teach, he became Principal of the Dover High School, where he made a splendid record during the next two years.

Partially because of physical handicap, he desired to become a physician. Hence, he returned to the University of Minnesota Medical School and graduated with the class of 1921. Of his work while a student in the School of Medicine, Dean Lyon says:

"Dr. Boquist made a superior record as a student in the Medical School and left a fine reputation for reliability, steadiness of purpose, cooperative spirit, and courteous behavior. I have watched his career with interest and greatly regret his untimely death."

Immediately following graduation in medicine, Dr. Boquist spent six months as resident physician at the Glen Lake Sanatorium, after which he took an internship at the Minneapolis General Hospital. In 1922 he became a member of the Glen Lake Sanatorium Staff and the same year was married to Miss Marion Scovell of Minneapolis. Dr. Boquist remained on the resident staff of the Glen Lake Sanatorium until 1925. Concerning his service there, Dr. E. S. Mariette, Superintendent of the Sanatorium, says:

"Dr. Harold Boquist was one of the Senior Resident Physicians at Glen Lake Sanatorium from July 17, 1922, to September 1, 1925. During that time he gave excellent care to his patients and was well loved by them and his fellow physicians. When he resigned his position as Senior Resident Physician he did not sever his connection with this institution but became the first director of its Out-patient Department which was established at that time. His loss as a friend and a physician is keenly felt by all who were associated with him as it must have been by all of those who were his patients."

Since early infancy Dr. Boquist had suffered from severe attacks of bronchial asthma. It was probably this, together with the existence of clini-

cal tuberculosis among his relatives, which gave him a desire to become expert in the diagnosis, treatment, and prevention of chest diseases.

In 1925 he became a member of the staff of the University of Minnesota Chest Clinic, and later held the position of Instructor in Medicine. In 1927 he was elected to membership on the medical staff of the Lymanhurst School for Tuberculous Children, and in 1927 he became a member of the staff of the Out-patient Chest Clinic of the Minneapolis General Hospital. All of these positions he continued until his death. Having known him very well while he was still a student and having since been quite intimately associated with him on various hospital staffs, I had an opportunity to observe his work carefully. He possessed to a remarkable degree that very important quality of a physician, namely, the ability to sympathize with and act kindly toward sick people. He was especially sympathetic to the poor. This quality, together with his store of information on medical subjects, the personal interest he showed in each patient, and his trustworthiness in every respect, quickly gained the confidence of his patients. In the charity clinics many patients asked to see him regularly. Since his illness and death they still come to the clinics and request the same medicine which he had prescribed. Dr. Boquist's training in the School of Education and his subsequent teaching experience in public schools qualified him to teach in an excellent manner in the School of Medicine. It was a common sight in the dispensaries to see a large group of students following him from room to room, where patients were being examined and treated. While in medical school, he was a favorite student of Dr. R. E. Scammon, who later, as Dean of Medical Sciences, directed some of his work. The following is a tribute Dean Scammon desires to pay him:

"Doctor Harold Boquist first became my student seventeen years ago. From the outset he showed a quiet maturity of judgment, a grasp of his scientific problems and a systematic approach of his work that marked him among his fellows. It was no surprise to those who had known him as a student to see him do so well in clinical practice, teaching and research. I think his own physical handicaps made him the more sympathetic to his patients and to his students. His sudden death, in the midst of his active work, is a distinct loss to all of us."

His private practice took him to most all of the private hospitals in the city of Minneapolis and he was a member of the medical staff of St. Andrews, Swedish, Asbury and Fairview Hospitals. In 1932 I had the honor and pleasure of nominating him for the position of chief of staff of the Thomas Division of the Fairview Hospital. He was unanimously elected and served in that capacity for the usual term. During that time he took an unusual interest in the patients and did much to elevate and perpetuate the standards of the service.

In 1925 Dr. Boquist entered the private practice of medicine. Although he did general practice he retained his interest in tuberculosis and other diseases of the chest. Here he practiced the most modern methods of diagnosis and treatment. He was especially interested in such procedures as artificial pneumothorax, phrenic exeresis, and extrapleural thoracoplasty and when it was within his power he never allowed his patient's disease to pass the stage when life might be saved by one of these procedures.

Dr. Boquist always made very careful studies of the conditions from which his patients suffered. His reputation in this respect was not only appreciated by strangers but also by his immediate relatives. They came to look to him for aid in the solution of their various medical problems. In fact, he kept one sister's lung under a state of collapse for approximately seven years and restored her to a very good working capacity. He also spent a great deal of time aiding another sister who was treated by artificial pneumothorax for some time and later by extrapleural thoracoplasty. She was the first patient in the Northwest to go through pregnancy following this operation.

About 1922 a girl in the teen-age period developed tuberculosis and was later treated in the Parkview and the Glen Lake Sanatoriums. Finally, extrapleural thoracoplasty was performed in the latter institution and upon discharge this girl became a private patient of Dr. Boquist. She was later married and so far as we know was the second patient in the Northwest to go through pregnancy after extrapleural thoracoplasty had been performed. She remained under his care and went through a second pregnancy successfully. He took a great deal of pride in these cases and often pointed out the fact that modern methods of treatment, even for some advanced cases of tuberculosis, were capable of restoring them to such excellent health that they are able to lead normal lives, whereas in times past the majority of such patients remained invalid and died untimely. This patient and her entire family had continued to look to Dr. Boquist for advice and care and like so many of his private patients expressed the great loss they had sustained by his death.

Not only was Dr. Boquist well informed on medical literature but he also had a scientific and research spirit. He had published several articles and was senior author of an article now in press in the American Review of Tuberculosis. He also had other problems in progress, at least one of which will probably be completed. He was a firm believer in medical organization and took an active part in the Hennepin County Medical Society. He also held membership in the Minnesota State Medical Association, the American Medical Association, the Minnesota Trudeau Medical Society and the Hennepin County Tuberculosis Association.

On Easter Day, 1934, he developed a sore throat. Although he was very uncomfortable, he took his wife and four children, Howard, 11 years, Harold, 9 years, Alice, 7 years, and Lowell, 2 years, to church, as was his custom. The throat symptoms finally disappeared but he had lost his sense of general well-being. During the month of June he was found to have a blood stream infection and died of streptococcic endocarditis on June 12, 1934.

Dr. Boquist had always maintained the high ideals taught by his mother and father. He inspired many students to do better work than they would otherwise have done. Hence, they have become better physicians. He greatly extended and saved the lives of many persons; thus, although he died at an early age his influence continues.

In order to express their recognition and appreciation of his worthwhile life and to perpetuate some of the work which he begun, as well as his memory, his friends are arranging to establish an annual lectureship on respiratory diseases, both at the School of Medicine at the University of Minnesota and the Hennepin County Medical Society.

J. A. Myers, M.D.

NEWS ITEMS

Dr. J. W. Byram, Echo, has moved to Young America, Minn., where he will continue general practice.

Dr. L. J. Monson has become associated with Dr. P. E. Hermanson in general practice at Hendricks, Minn.

Dr. H. A. Hayel, Faribault, has opened new offices for general practice in that city. Dr. Hayel is a graduate of Creighton University, Omaha.

Dr. Arthur Thompson, formerly of Raymond, has moved to Cokato, Minn., where he will continue general practice, and also operate the Cokato hospital.

The Black Hills hospital, which has been operated at Hot Springs, S. D., for the past five years, has been permanently closed, the patients being transferred to the Lutheran hospital.

Dr. A. L. Abraham, who has been in active practice at Gibbon, Minn., has sold his practice to Dr. Kenneth Olson, Minneapolis, a recent graduate of the University of Minnesota.

The Minnesota State Medical association awarded the new president's cup for the first time this year, the award going to the St. Louis County Medical society for its outstanding health work during the past year.

Approximately one per cent of the total amount of money spent for relief in Minnesota, for the year ending June 30th, went for medical and nursing care and for medicines for relief patients in their homes.

Dr. W. H. Welch, one of the pioneer physicians of North Dakota, celebrated his 79th birthday anniversary last month, at his home at Larimore. His many friends extended him a party which was largely attended.

Embarking on the seventieth milestone in life? Dr. Charles H. Mayo, Rochester, is looking forward to August 8, when President Roosevelt will confer on him and his brother, Dr. William J. Mayo, honors for their contributions to humanity.

The 66th annual meeting of the Wabasha Medical Society was held at Lake City, Minn., last month, and elected Dr. R. C. Radabaugh, Hastings, president; Dr. C. G. Ochsner, Wabasha, vice-president, and Dr. W. F. Wilson, Lake City, secretary.

Contract for construction of Vermillion's, S. D., $100,000 40-bed community hospital probably will be awarded this month. It is expected the structure will be finished, with the fixtures, equipment, and furniture installed, late this fall, and first patients at the institution receiving hospitalization on or before the first of the year.

Physicians of four North Dakota medical societies assembled at San Haven last month for an all-day program including study and discussions of tuberculosis, and a period of recreation in the evening. The four groups attending the

meeting were the Border society, the Devils Lake society, the Northwest district society, and the Tri-county society.

The Minnesota State Medical Association elected the following officers at their annual meeting at Duluth last month. Dr. W. A. Coventry, Duluth, president;Dr. A. G. Chadbourn, Heron Lake, first vice-president; Dr. E. S. Boleyn, Stillwater, second vice-president; Dr. E. A. Meyerding, St. Paul, secretary, and Dr. W. H. Condit, Minneapolis, will entertain the 1935 meeting.

Dr. Walter J. Marcley and Dr. C. B. Wright, representing the Hennepin County Medical Society, and Dr. J. A. Myers and Dr. E. S. Mariette, representing the Hennepin County Tuberculosis Association, have been appointed to the committee in charge of selecting the speaker to address the Hennepin County Medical Society at the December meeting under the Dr. John W. Bell lectureship.

The "hobby show" of the Olmsted-Filmore-Houston-Dodge county medical society was the major feature of the summer meet last month at Rochester, Minn. Golfing attracted many of the members in the afternoon. A supper and dance concluded the program. A novel exhibit cleverly arranged on the clubhouse veranda, the hobby show revealed many after-office-hours activities of the medical men.

At the annual meeting of the Montana State Medical Association, held at Helena, on July 12th, Dr. C. E. K. Vidal, Galen, was elected president. Dr. L. H. Fligman, Helena, president-elect; Dr. Ashley W. Morse, Butte, vice-president, and Dr. E. G. Balsam, Billings, secretary, was re-elected for the 21st time. Councilors are Dr. T. L. Hawkins; Helena; Dr. J. B. Hobson, Missoula; Dr. L. G. Dunlap, Anaconda; Dr. L. T. Sussex, Havre; Dr. E. N. Jones, Wolf Point.

Thirteen men were granted licenses to practice medicine in North Dakota as a result of examinations by the state board of medical examiners, according to Dr. G. M. Williamson, Grand Forks, secretary of the board. Those who received the licenses were Maurice Martin Heffron and H. Lawrence Reichert, Dickinson; Edward John Zeiss, Wildrose; Delmar Robert Gillispie, Forest River; Henry P. Rosenberger, Bismarck; Charles Albert Areson and Robert Brown, Fargo; Robert T. Gammell, Kenmare; Hovald K, Helseth, Litchville; August C. Orr, Sarles; Norman James Rose, Dazey, Herbert Hamlin Miller, Wahpeton, and Walter Livingston Forster, Minot.

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These changes were made at the request of the Council on Pharmacy and Chemistry of the American Medical Association, which has accepted these products. S. M. A. Corporation cheerfully changed the names and made all other necessary adjustments because of their desire to co-operate with the Council.

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LILLY LABORATORY

The new Lilly Research Laboratories are nearing completion and will be ready for occupancy in early October.

Throughout an existence of nearly 60 years Eli Lilly & Co. have been guided in their efforts to serve the professions by men whose primary interest has been the production of medicinal products for use in prescriptions written by physicians. Colonel Eli Lilly, the founder, was a skilled pharmacist with an aptitude and enthusiasm for his work, for making prescription supplies in new and better ways. His son, Josiah K. Lilly, throughout his connection with the company, a period covering 58 years, has been a persistent experimenter who has constantly sought to improve products and processes. To him belongs the credit for establishing the first Lilly research activities in a special laboratory devoted wholly to that phase of the industry.

A member of the third generation of the Lilly family, Eli Lilly, a grandson of the founder, is now

president of the organization and it is under his direction that the culminating point in Lilly research activities has been attained through the completion of the magnificent structure that will be formally opened in the fall. These new laboratories will embrace the very latest facilities for scientific work and they will also reflect the progress of modern medicine. A broad and far-reaching program has been planned in keeping with the spirit of medical research and the aspirations of a company that since its inception has recognized the need for close affiliation of research with practice.

ANTIPHLOGISTINE

In the management of the ordinary accident and wound cases local treatment generally requires a surgical dressing which, also, is an efficient antiseptic. To be an ideal antiseptic, however, it must be one which, while inhibiting the bacteria in vivo, will not destroy the tissues and break down their natural resistance. It must be one which will nourish, support and promote the cells in their rehabilitating process while exercising their antiseptic powers.

There are, of course, countless antiseptics and surgical dressings for the practitioner to select from, but as an application, fulfilling the requirements of an ideal antiseptic surgical dressing, few preparations are better adapted for the purpose than is Antiphlogistine. A glance at its formula—45% c. p. glycerine, boric acid, a minute quantity of salicylic acid, iodine, oils of peppermint, gaultheria and eucalyptus, blended in a base of the finest dehydrated silicate of aluminum—will easily explain the reason for its efficiency in the treatment of injuries and accidents.

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G. M. WILLIAMSON, M.D., Grand Forks..... 1935

FOURTH DISTRICT

E. M. RANSOM, M.D., Minot..... 1936

FIFTH DISTRICT

F. L. WICKS, M.D., Valley City..... 1936

SIXTH DISTRICT

N. O. RAMSTAD, M.D., Bismarck..... 1935

SEVENTH DISTRICT

P. G. ARZT, M.D., Jamestown..... 1934

EIGHTH DISTRICT

L. B. GREENE, M.D., Edgeley..... 1934

NINTH DISTRICT

E. L. GOSS, M.D., Carrington..... 1936

TENTH DISTRICT

A. E. SPEAR, M.D., Dickinson..... 1934

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W. H. LONG, M.D. ..... Fargo
W. F. BAILLIE, M.D., Alternate..... Fargo

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J. D. GRAHAM, M.D. ..... Devils Lake

GRAND FORKS DISTRICT MEDICAL SOCIETY

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FRANK WEED, M.D. ..... Park River

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L. B. DOCHTERMAN, M.D. ..... Williston
I. S. ABPLANALP, M.D., Alternate..... Williston

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R. W. PENCE, M.D. ..... Minot
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NO REPORT

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H. A. BRANDES, M.D. .....Bismarck

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SOUTHWESTERN DISTRICT MEDICAL SOCIETY

A. P. NACHTWEY, M.D. .....Dickinson

STUTSMAN COUNTY MEDICAL SOCIETY

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R. C. LITTLE, M.D., Alternate.....Mayville

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PROCEEDINGS
of the
HOUSE OF DELEGATES
of the
FORTY-SEVENTH ANNUAL SESSION OF THE NORTH DAKOTA STATE MEDICAL ASSOCIATION

Sunday, May 27, 1934

The first meeting of the House of Delegates was held at the Hotel Gardner, Fargo, North Dakota, and was called to order at 3:00 p. m., by the President, Dr. Jesse W. Bowen, Dickinson.

ROLL CALL:

Secretary Skelsey called the roll and the following Delegates, Councilors and Officers responded:

E. M. Watson, Fargo.
W. F. Baillie, Fargo.
J. D. Graham, Devils Lake.
R. E. Leigh, Grand Forks.
Frank Weed, Park River.
William Campbell, Valley City.
H. A. Brandes, Bismarck.
A. P. Nachtwey, Dickinson.
C. A. Hjelle, Portland.
Pearl V Matthaei, Fessenden.
Murdock MacGregor, Fargo.
G. F. Drew, Devils Lake.
G. M. Williamson, Grand Forks.
A. R. Sorenson, Minot.
N. O. Ramstad, Bismarck.
P. G. Arzt, Jamestown.
L. B. Greene, Edgeley.
E. L. Goss, Carrington.
A. E. Spear, Dickinson.
C. E. Stackhouse, Bismarck.
A. D. McCannel, Minot.
Paul H. Burton, Fargo.
W. C. Fawcett, Starkweather.
President Bowen and Secretary Skelsey.

The President declared a quorum present and the House duly constituted for the transaction of business.

MINUTES

Secretary Skelsey moved that the minutes of the Forty-sixth Annual Session as published in THE JOURNAL-LANCET, August 15, 1933, be adopted, and the reading of minutes be omitted.

The motion was seconded and unanimously carried.

REPORT OF THE SECRETARY

The Secretary, Dr. A. W. Skelsey, presented the following report:

Number of members to May 26, 1934, based on reports of this spring, three hundred and forty-seven (347), compared with three hundred and twenty (320) a year ago. There yet remain some well-to-do delinquents, who probably will pay their dues later. Richland County sends us neither an annual report nor a check; possibly due to a delayed annual meeting of that Society.

Detailed statement of receipts attached hereto.

Four new Standing Committees have been created, viz.:

On Medical Economics.
On Public Relations (Newspapers).
On Early Care of Mental Cases.
On Cancer Survey in North Dakota.

Our State Constitution, issued year 1919, made provision for Committee on Medical Malpractice Suits, to assist in defending our members; but although that plan of the Association was cancelled several years, and several pages of the Constitution thus made void, yet yearly such titled standing committee is continued. Are these appointments now necessary? If so, what are the duties of the committee? Should the Constitution now be revised, or allow the subject to rest?

THE JOURNAL-LANCET has given us excellent service during the year. Some special numbers of very high merit were issued at intervals. North and South Dakota have not directly contributed so much as might be expected of them. Of course the annual transactions and the papers read at our state sessions appear in the magazine; but more than that is desired from the sister states. Several months ago we made an open appeal to our own members for more papers. Such a general request is not without danger, yet the response to date has not overwhelmed the printing presses.

Health Records in the United States, Etc.: Twelve months ago we reported that the preceding year had shown the lowest death rate for many years, not only in our own country, but also in Canada and abroad, the exceptions being the continued increases in cancer, chronic nephritis, diabetes, appendicitis, and diseases of the heart. Practically the same statement can again be made, with the exceptions noted above. Of course tuberculosis is on the list of high mortality, but much below former years. Some statisticians discuss the remarkable vitality of Canada, stating that but few civilized countries can boast of a natural

increase in their population equal to that observed in Canada. With a death rate actually lower than that of the United States, Canada still has a higher birth rate than that of the United States ten years ago.

Headliners for newspapers, medical journals, and radio talks, were the many cases of amebic dysentery reported by Chicago's Health Officer, Dr. Bundesen, who alleged that the disease largely had its origin in Chicago during the World's Fair year of 1933. There were a number of deaths, but North Dakota was not seriously affected. Certain physicians throughout the country protested that Dr. Bundesen should have sent out more timely warning than he did; some also intimated that the existence of that outbreak had been kept under cover too long, with probably the idea of helping protect Chicago and its "Century of Progress" from unpleasant notoriety. Which may prove the belief that no matter how a man tries to do what he considers right and expedient, he will finally get some unexpected and perhaps undeserved slams.

While deaths from automobile accidents are not strictly under the heading of health items, its mortality must be noted. Last year the deaths were 29,900. Insurance companies note that the fatalities increased 5.9% per accident; while the number of persons injured *non-*fatally increased only 2.2% per accident. This percentage of increase the companies claim is very probably due to the fact that the rate of speed of automobiles has been stepped up very considerably in the last few years. North Dakota's death rate in 1933 was exactly 100% over 1932; and already this year the percentage of such deaths is almost 100% over the corresponding period of the year 1933.

On account of heavy financial loss to many hospitals and to doctors, due to the thousands of cases of accidents from automobiles being sent into hospitals or placed directly under doctors' care, the American Medical Association urges state-wide legislation, seeking some material relief through levies upon such insurance policies that may be carried by those injured. The trouble here is that the majority of such accidents are due to extreme carelessness, yet hundreds of these people carry no liability insurance; hence hospitals, especially the smaller ones, and the doctors are financially crippled.

The newspaper and general magazine sob-stuff covered by such headings as "Needless Sacrifice of Mothers and Babies" continue to break loose, and apparently is eagerly devoured and believed by a certain percentage of the public. Dr. DeLee of Chicago, in his current Review of Obstetrics, quotes approvingly the following from the Illinois Medical Journal:

"It is a strange thing that many intelligent people, both within and outside of the medical profession, seize upon the notion that the United States has the highest maternal death rate in the world, and shout from the housetops their implicit faith and belief in that statement. The gross statistical tables indicate that the statement is true. An analysis of *all* the factors involved in computing the statistics shows that it is *not* true."

In other words, the system of data abroad does not correspond with our own.

DeLee, however, caused quite a tempest in the tea-pot when he published the statement that the data which he had collected, showed better results from home deliveries than from the wards of the general hospitals; cited 38 epidemics of puerperal infection, of which 35 were in the maternity wards of general hospitals. Naturally, the hospitals went on the defense; but perhaps the excitement has now died down, soon to be replaced by some other headliner affecting the medical profession.

Minnesota claims that its maternal mortality rate is the lowest in the country, being 38.8% lower than for the country at large.

Next year this state will go through the ordeal of the legislative sessions. Judging from the attention some newspapers and magazines have lately been giving to the subject of vivisection, it is evident that the unhappy anti-vivisectionists are again on the war path, and probably will bob up in North Dakota as heretofore. In Chicago, Dame Castle-McLaughlin, originally noted in dancing circles, with her associates in the anti-field, lately has filed suit there in the Appellate Court against the city ordinance which permits the unrestricted use of live dogs for surgical demonstrations; the plea of these people being that such ordinance authorizes the giving away of property by the city without compensation; also that it conflicts with Section 144 of the Criminal Code, under which cruelty to animals is punishable. The Christian Science Monitor for February 23, 1934, shies its hopeful good-luck horse-shoe into the arena, and quotes Clarence Richard, Managing Director of the National Anti-vivisection Society, as follows:

"Mr. Richard hopes to arouse public sentiment against current medical laboratory practices. Experiments upon eight dogs at Yale University, reported in the January issue of the Journal of Experimental Medicine, were commented on by Mr. Richard in his statement today. The dogs were fed on abnormal diet, which killed the first dog in 31 days; the eighth in 331 days, or almost a year, he said in his resume of the article.* . . . What did this torture prove? . . . Done in the name of science, cruelties to dogs have yet to indicate any solid contribution to the well-being or happiness of man."

It is quite reasonable to expect this sort of "literature" in North Dakota within the next few months.

A few years ago one of the European writers classified the political systems of the leading world nations under the titles of Capitalism, Fascism, and Communism. Although the United States may yet be included under Capitalism, we can also use the sub-title of Franklin Rooseveltism, as the key-note to the many new plans aiming to bring back our country to normalcy. So far as our own state medical profession is concerned, each individual now knows best how the world has fared with him; but here reference may be made to the so-called Federal Emergency Relief Administration, the Civil Works Administration, Federal Relief to Transients, etc. How this state has been affected thereby will be detailed by our separate Committee on Medical Economics at this session.

As regards these Federal Relief plans and some of the reactions upon the medical men, a few illustrations may prove interesting, and also show how affairs may become complicated for us under the so-called New Deal, viz.:

Last November the Orleans Parish Medical Society issued a lengthy pamphlet, opposing an application made by the Charity Hospital of New Orleans, for a loan of about $10,000,000 from the Federal Emergency Administration of Public Works, concerning which loan the said medical society had engaged the services of an attorney, to combat the loan for the additional building and the equipment therefor. Medical society objected to this mainly on the grounds that New Orleans already had seven private and denominational hospitals, which could handle all city and non-resident cases; whereas the erection of this proposed new building would cripple still more the existing hospitals, especially so as the Charity Hospital (in its application to the national government and in order to ease the mind of Uncle Sam as to the possibility of return payments to him in future years) submitted a plan wherein the said Charity Hospital agreed to hospitalize *pay*-patients in the new addition—thus greatly to the financial detriment of the other hospitals. This, of course, differs from complaints made by the profession against the government for erecting and maintaining for the veterans, hospitals in towns already fully supplied with general hospitals which could often be utilized for such veterans as were entitled to hospitalization and medical care generally.

The Medical Society of Virginia, by refusing to have anything to do with the Federal Emergency Relief Administration, rejects what it terms the socialization of medicine. (Illinois Medical Journal, May, 1934.)

Per contra: Medical schools, colleges, and the larger universities have applied to and have induced the Public Works Administration to afford financial aid to such institutions, thus giving part-time employment to certain students, enabling them to remain in college.

A communication from another state gives information regarding the Federal Emergency Relief Administration and its attitude there toward the medical men: "The administrator was contacted by the Medical Committee and temporary minimum fee schedule adopted, with discount. However, before this schedule was put into operation the State Administration set up a fee schedule of their own. Their fee schedule did not follow the Rules and Regulations of Bulletin No. 7, and was not satisfactory to the medical profession. The profession have not been able to contact the State Administration. A conference was refused the committee. The State Relief Administrator repudiated his agreement with the committee of the State Association appointed by the Council. The State Administrator resigned and the office has been administered by the Governor. The Governor called a meeting of physicians to meet him this May, to plan for adequate medical care. There was also planned a meeting for the dentists. However, the Governor was called to Washington, and the conference has been postponed by request of the medical men. Medicine should have a medical man to administer the medical serv-

*Experiments in pellagra?

ices; one who could evaluate the services in a given case. The Rules and Regulations specify adequate medical care. The question is, What Constitutes Adequate Medical Care? Can a layman comprehend what may constitute that kind of care?"

Other legislation affecting our profession:

House of Representatives Bill No. 6663, entitled the Independent Offices Appropriation Bill. This title is very deceptive to the outsider, and merits your attention and consideration, even though the bill finally passed in spite of the veto of President Roosevelt. An amendment had been inserted by the Senate, having for its object the restoration of certain benefits to the veterans. I quote from a speech made by President Roosevelt, in which he laid before the American Legion at its convention last October, the two following fundamentals:

"(1) Generous provision should be made for men really disabled in line of duty, and for their dependents.

"(2) Military service, as an obligation of citizenship, warrants no special privileges because of disabilities *un*connected with that service, and care of such veterans should be primarily by local relief agencies, *as it is for other citizens.*"

This spring we received a telegram from the American Medical Association headquarters, urging a decided protest against that bill as amended by the Senate, said amendment seeking to authorize the appropriation of large sums of money, account veterans' relief, which would nullify to some extent the economy plans previously recommended and adopted through the efforts largely of the National Economy League,† other organizations, and President Roosevelt. In the name of our State Association, telegrams of protest were sent to the officials in Washington, and also to our state Senators and Representatives.

As you can well imagine, outside of the replies from the governmental officers cooperating with the President, the answers from our state people were not overly-definite.

Yet there was one exception to the charge of indefiniteness, and in writing to us that man gave forth the following, which certainly showed his colors at that time, viz.:

"I am for the Bill as amended by the Senate 1,000%, and from my way of thinking, the Medical Association of North Daokta ought to be for it, and so should any medical association. This government has treated its protectors and defenders with disgrace and dishonor, and ought to be ashamed of itself. The hospitals were built by the people of this nation for the veterans, and while I have no objection to other people using them when there is room, the veterans should get the use of the hospitals. If not, there will be new faces in Congress after the next election."

Such vigorous and clearly-cut language must be real manna to the veterans who like that kind. Among those over-riding the President's veto, and therefore helping to pass the bill, were Senators Nye and Frazier of North Dakota.

From the standpoint of the medical profession permit me to quote some of the issues raised by our national organization, the A. M. A., viz.:

"Section 29 of the law reads as follows:

" 'Section 29. Sec. 6 of Public Law Numbered 2, 73rd Congress, as amended by Public Law Numbered 78, 73rd Congress, is hereby amended by adding thereto the following proviso:

" '*Provided,* that any veteran of any war who was not dishonorably discharged, suffering from disability, disease or defect, who is in need of hospitalization or domiciliary care, and is unable to defray the necessary expenses therefor (including transportation to and from the Veterans' Administration facility) shall be furnished necessary hospitalization or domiciliary care (including transportation) in any Veterans' Administration facility, within the limitations existing in such facilities, *irrespective* of whether the disability, disease, or defect, was due to service. The statement under oath of the applicant on such form as may be prescribed by the Administrator of Veterans' Affairs shall be accepted as sufficient evidence of inability to defray necessary expenses.' "

The American Medical Association has consistently taken the position that the Federal Government ought not to provide medical, hospital, and nursing services for veterans who are able to provide such services for themselves, for injuries and diseases in no way related to military service.

One may say that the present legislation limits medical, nursing, and hospital services for veterans, given at the expense of taxpayers generally, to *indigent* veterans. Please note,

†Fargo Forum, June 2, 1934, quotes McQueen, National Commander, A. V. W. W., as stating at Fargo meeting that date, " . . . The National Economy League was formed for but one purpose—to degrade and besmirch the name of the man who served his country in war."

however, that the word INDIGENT is not used. Please note, too, that every veteran is apparently the final judge of his own ability to defray the necessary expenses of medical, nursing, and hospital services; the Administrator of Veterans' Affairs can question no affidavit made by a veteran. Whether "inability to defray necessary expenses" means inability to pay spot cash for them, or inability to pay for them in the course of six months or a year, or simply the inability to pay for them without having to forego some of the luxuries of life, is *not* stated.

The present law goes far beyond anything ever heretofore contemplated. Under the World War Veterans' Act, 1924, under which the gross abuse of medical, nursing, and hospital privileges for veterans, rich and poor alike, suffering from non-service diseases and injuries grew up, hospitalization was absolutely and unqualifiedly discretionary with the Administrator of Veterans' Affairs, except in so far as it related to certain named chronic diseases. The World War Veterans' Act, 1924, Section 202, Subsection 10, provided:

"The Director is further authorized, so far as he shall find that existing Government facilities permit, to furnish hospitalization and necessary traveling expenses to veterans of any war, military occupation, or military expedition since 1897, not dishonorably discharged, without regard to the nature or origin of their disabilities: Provided: That preference to admission to any Government hospital for hospitalization under the provisions of this subdivision shall be given to those veterans who are financially unable to pay for hospitalization and their necessary traveling expenses."

If, under the proviso set forth above, any effort was ever made to classify applicants for hospitalization at the expense of the taxpayers generally, in the order of the ability of the applicants to pay for medical, nursing, and hospital services, it was never apparent. As a matter of fact, veterans themselves bitterly resented any inquiry into their financial resources and any implication that hospitalization at the expense of the taxpayers generally was given them because of their need and *not* as a matter of absolute right. It was under this strictly permissive clause in the Act of 1924 that the hospital building program of the Veterans' Administration, costing tens of millions of dollars, developed and was carried into effect.

It may be suggested that "Such form as may be prescribed by the Administrator of Veterans' Affairs" will be in a form that no veteran who is *not* in necessitous circumstances can swear to without perjury. If experiences under the permissive provisions of the World War Veterans' Act, 1924, is any guide, and if the attitude of veterans under the terms of the earlier Act means anything, the development of such a form by the Administrator of Veterans' Affairs is hardly within the range of the remotest possibility. It may be set down as almost a certainty that no form will be provided that necessarily brings the applicant veteran within the category of *indigents within the meaning of that term as used in the course of poor relief in the several counties, cities, towns, and villages of the country.*

Of course, it is well recognized generally that except in cases of grave disaster it is the duty of the state, county, city, town, and village to provide medical, nursing, and hospital services for their own indigent ill and injured. The providing of such service is *not* a function of the National Government except in the face of disaster. If, however, the National Government is going to undertake to provide, medical, nursing, and hospital services for the ill and the injured in any given state, it should do so on a rational basis, *giving the gratuity to all persons in the same class, on equal terms.* Inasmuch as the military services of veterans, as indicated by service-connected diseases and injuries, is separately cared for, *the moment the Government goes outside of the field of service-connected injuries and diseases, and undertakes to provide treatment for diseases and injuries NOT of service-origin, the National Government should render the same service to every citizen of the United States. It is idle to say that veterans are any more deserving than many others.* There are hundreds of thousands of persons who were so young at the time of the World War that could by no possibility have entered; others who were so old and infirm that they could not have entered; and others who were incapacitated and prevented from entering by physical disabilities. No one can impugn the patriotism of those people, nor contrast it unfavorably with the patriotism of veterans. If medical, nursing, and hospital services are to be provided by the National Government for veterans, it should be provided for everyone.

The distribution of medical, nursing, and hospital services among veterans themselves is unfair to them. A veteran who happens to be

near a Veterans' Administration hospital gets the benefit of the service that a man living at a more remote point does not. A man who is seriously injured at a remote point gets no medical service from his Government; a man who is seriously injured nearby, does. A man who is so ill that he cannot be moved, gets no service, even though he may be near a hospital; a man who is not so ill and can be moved, does. A man who does not happen to be injured or to be taken ill, gets no benefit from the Governmental gratuity, no matter how deserving his case may be. A veteran may go hungry, naked, and without shelter, but the Government will not provide them for him until they result in disease or injury and he can claim the right to hospitalization. The whole scheme is a gamble.

So far as the immediate relation of this matter to the medical profession is concerned, the scheme tends to take from private practice and private hospitals many men who are perfectly able to pay the charges for the services of local physicians and hospitals, and who would do so were it not for the Governmental bounty. The result is likely to be increased difficulties in the way of medical and hospital services, particularly in the smaller communities of the country. Physicians throughout the country are called upon to pay Federal taxes in order that the Federal Government may take their patients away from them and carry them, it may be, hundreds of miles to a Governmental institution, and keep them there for prolonged periods. If veterans who are suffering from diseases and injuries *not* of service origin are entitled to medical, nursing, and hospital services at the expense of the Federal Government, the Federal Government would make a more equitable distribution of its bounty, and on the *per diem per capita* cost would save money, by providing for the treatment of such patients in their own homes, by local physicians, local nurses, and local hospitals; and it could do so without disrupting medical practice and increase the likelihood of bankrupting hospitals.

Finally, the Federal Government has no right to enter into such a scheme of gratuities as is the hospitalization scheme; and veterans have no right to ask it to do so, until the needs of every veteran suffering from disease and injuries *contracted in the service* are met and also the needs of every widow and child of every veteran who lost his life in the service or as a consequence of service. Not until those who are suffering directly or indirectly from injuries *incurred in the service* are fully provided for, should the Government throw about its gratuities with a wasteful hand. The old adage, "Be just before you are generous," should apply to Governmental affairs as well as those of the individual."

I hope you will pardon me for this lengthy quotation, but in view of certain conflicting opinions and also of the possibility of additional demands along these lines being made upon the National Treasury, I believe that you should have access to the above data; also, if the plan is agreeable to you, that the same should be inserted, with our annual report and transactions of our Association, in some issue of THE JOURNAL-LANCET, in order that all of our members can get some understanding of the subject, even though it be from the medical side of the house. It is here quite correct to state that some of the veterans frankly admit that due to the zeal of many vote-seeking politicians yearning for the Washington location and salaries, the veterans themselves have been getting even more than they (the veterans) had anticipated or actually requested (demanded).

Last January, "Time" of New York warned the public that there would be a determined effort to tack onto this so-called Independent Offices Appropriation Bill an amendment of the purport shown above; also stated then that some of the Congressmen evidently were willing to bleed, battle, and die for pensioners. It was claimed also that among other "features" of the Bill, the document proposed to restore to all Congressmen five per cent of a former cut of ten or fifteen per cent in their salaries.

In Congress also the Birth-Control Bill bobbed up, but so far as known to date it has again fallen by the wayside. The Congressional Committee discussions on this topic filled several hundred pages of a closely-printed volume. Usual arguments and slurs. Into the Exhibit was quoted the action of the American Medical Association, at its annual meeting in Milwaukee last June, where, by a vote of 66 to 46, a previous Resolution to consider the question, was voted down. The gist of the Association's decision was, I believe, a sincere desire to avoid verbal brawls, and probably also to conciliate the clerics and their followers, who were opposed to any discussion or the appointment of the Committee requested by the Resolution.

The Tugwell-Copeland Bill, to Regulate Foods, Drugs, and Cosmetics: Up to this time the Bill, even as amended and deleted, has not yet come out of Committee. It has been interesting to note the reaction, especially the vicious attacks against it, under various pretexts. Some of the objections quite probably were well taken; on the other hand, doubtless the brunt of the attacks was by proprietary concerns and even some newspapers, fearing probable loss of business from a reasonable supervision by the Government. On page 411 of the Congressional Committee's Proceedings over this Bill is the following:

> "One of those special interests, the wholesale grocers, last night sent telegrams to every newspaper having a Washington correspondent, threatening that the Tugwell-Copeland Bill would mean a loss of advertising revenue, and urging opposition. Seldom has the bare hand of advertising opposition been so plainly disclosed in an attempted control of news column."

(On the same page is included a copy of the telegram referred to.)

Under much pressure the sponsors for the Bill had agreed to amend same, and have done so to such an extent that it is now called the emasculated measure. I have brought to our meeting a copy of the original and of the amended Bills in case you desire to compare them. One of the objects of the Bill was to acquire control over advertising, by requiring truthful statements in bill board, newspaper, magazine, and radio advertising, as well as on labels. This plan, if properly enforced, would help to reduce much of the current ballyhoo and actually dishonest advertising.

The physicians and economic conditions in general: We can take it for granted that throughout the whole land, our profession keenly admits the Depression. Hospitals appear to be busily engaged in very active and questionable competition: some are offering, for a very low annual subscription, hospitalization for 21 days. The cheapest bid I've so far read is by one hospital in New York City which accepts a $10.00 annual subscription for the 21-day plan; the offer being restricted to "white-collar workers" earning Five Thousand Dollars or less a year; said annual payment to include one major operation. It might seem that one having such a generous income could not be cheap enough to accept that bargain rate; but in these chiselling days it perhaps may be considered proper. This, too, brings up the subject of commercial, medical, and group insurance. Some concerns are offering medical, surgical, and obstetrical services at greatly reduced rates, and are hiring regular physicians in order to evade conflicting laws. In Minnesota, the Supreme Court has ruled that institutions of that type are illegal. In Illinois, within the past few weeks, the Attorney-General has brought suit against similar organizations which have been running for several years; this to test their legality. Urged by their zeal to get patrons and money, some supposedly ethical medical clinics have been resorting to subversive measures. Now, in Los Angeles, California, under the questionable banner of Socialized Medicine, a very large clinic there is having a combat with the local medical society; said Society having ejected the clinic from its membership. This will bring the case before the A.M.A. The civil suit is now in progress. This is a reminder of a somewhat similar affair taking place in Texas about a year ago where, eventually, the clinic at fault is stated to have relinquished its non-ethical contracts, and applied to the local medical society for readmission. The newspapers claim that the Los Angeles concern maintains equipment and staff sufficient to take care of its patrons' list of 15,000 subscribers—equivalent to the care of about 50,000 persons. The plan includes, in addition to the Los Angeles force, the employment of doctors in about twenty suburban towns. The rate is $2.00 per month, and takes care of the subscriber and all of his dependents, regardless of the size of the family.

To add to the confusion, we have the large number of oncoming newly-graduated physicians. The Journal A.M.A. for April 28th, 1934 writes that the United States is tending to a stable population, due to restricted immigration; that it is evident that the medical profession is increasing faster than the general population and that, unless the states promptly initiate measures to restrict the number of those licensed to practice medicine, a great surplus of unemployed doctors will become apparent. Your attention is called to the Journal A.M.A. for May 12, 1934, containing a summary of the Report on the Socialization of Medical Practice, including Health Insurance. The complete Report is in the April issue of the Bulletin A.M.A.

Respectfully submitted,

ALBERT W. SKELSEY

Dr. W. C. Fawcett moved that the report be accepted.

The motion was seconded by Dr. Murdock MacGregor.

Discussed by Dr. L. B. Greene, who objected to having one portion of the report referring to Veteran's Legislation published.

Secretary Skelsey stated that he would like to have someone amend the motion, to the effect that the report be read entirely and considered by a committee.

The question was further discussed by Dr. Frank Weed, Dr. G. M. Williamson, and Dr. R. E. Leigh.

Dr. Fawcett's motion was then put to a vote and carried.

REPORT OF CHAIRMAN OF COUNCIL

Dr. L. B. Greene stated that there had been no further action by the Council since the report that appeared in the August 15, 1933, issue of THE JOURNAL-LANCET.

REPORTS OF COUNCILORS

First District

The Cass County Medical Society held eight meetings during the year 1933. One of the meetings was a joint meeting with the Fargo-Moorhead Retail Druggists Association.

At one meeting Dr. P. W. Brown, Rochester, presented a very instructive paper on colitis. Dr. L. W. Larson, of Bismarck, favored the society with a paper on the pathology of carcinoma of the breast that was much appreciated.

Medical economics were discussed at several meetings and one meeting was devoted entirely to the consideration of some of our local problems.

The depression is giving us pause to take stock, and there is no doubt many readjustments will take place. I am sure our profession will continue to merit the respect and confidence of the people in the same goodly measure as in the past.

Respectfully submitted,

MURDOCK MACGREGOR, M. D.,
Councillor.

Second District

During the past year the Devils Lake District Medical Society held five meetings. Our custom is to hold four meetings, but one special meeting was called to consider the organization of a District Relief Committee of Medical Economics.

During the year we have taken in five new members and lost three, two of these by non-payment of dues and one by death.

The meetings have been better attended than usual and considerable interest is shown in the society.

There has been no friction, and we consider our society a success.

Respectfully submitted,

G. F. DREW, M.D.,
Councillor.

Third District

The Grand Forks District Medical Society is well officered and has had a successful year.

There is a membership of sixty-one. Two men in the district are not members.

The society had as guest speakers during the year: Dr. Franklin Wright, Minneapolis; Dr. A. Davidson, Winnipeg; Dr. John McEachern, Winnipeg; Dr. A. D. McCannel, Minot; Dr. Kent Darrow, Fargo; Dr. R. C. Webb, Minneapolis, and Dr. E. M. Hammes, Minneapolis.

One meeting was devoted to medical economics.

The best of good fellowship prevails among the members of the profession throughout the district.

During the past year the society lost three members by death—Dr. J. C. Suter, Grafton; Dr. G. J. Gislason, and Dr. George D. Gertson, Grand Forks. These men took an active part in the work of the society and were regular attendants at all meetings.

I want to suggest again what I feel would be of advantage to the profession of our state; that is, to divide the state into at least four sections, and have a one-day meeting in each district during the month of October or November. A program devoted to medical economics, medical legislation and such other affairs as directly affect the general welfare of the profession as a whole would be of distinct advantage; in other words, this would not be a purely scientific meeting.

Acting in the capacity of executive officer for our Board of Medical Examiners for many years, I can see the importance of a better understanding of the practice of medicine as a business as well as an art.

Again I urge as I did in my report of a year ago, that the December meeting this year be devoted to a discussion of proposed medical legislation, and invite all senators and representatives in each district to be present.

Respectfully submitted,

G. M. WILLIAMSON, M.D.,
Councillor.

Fourth District

The Northwest District Medical Society has terminated an enjoyable and profitable year. During the summer months the meetings were held at the Country Club, and were entirely of a social nature. This type of meeting for our summer season has apparently become a fixture with our society, and has resulted in a large attendance especially of out of town men.

The balance of the year was given over to meetings combining social features and scientific programs. These meetings were held alternately at the Trinity and St. Joseph's Hospitals, beginning with a dinner at 6:30 p. m. A small charge was made for these dinners.

The scientific part of our programs has been interesting and instructive and has included some distinguished out of town speakers. With the possible exception of one or two meetings, I believe the men who attended from towns within our district were well repaid for their sacrifice of time and money.

Only one unfortunate incident marred an otherwise harmonious and successful year. The society found it

necessary to censure a member for unethical and unprofessional conduct in connection with efforts of the society to have the indigent taken care of by physicians of their own choosing. The matter went through the usual channels provided for in the by-laws of the state society.

The following figures from our secretary's files give the present condition of our society: Number of members in good standing, fifty-four; number of members dropped for non-payment of dues, two; number of members who have moved out of the district, none; number of new members, two; number of deaths, none; number of meetings held during the year, twelve; average attendance at meetings, twenty-six; number of papers read, four; number of cases presented, twelve.

Respectfully submitted,

E. M. Ranson, M. D.,
Councillor.

Fifth District

In the Sheyenne Valley Medical Society we have fourteen members, and at present there are four doctors in our territory who are not members, some of whom no doubt will affiliate with us.

For the first time in several years we have escaped loss by death in our membership.

We have had ten meetings and our men have attended a number of meetings at Jamestown upon invitation of the Stutsman County Society.

Many of our meetings have been called in consideration of Medical Economics, and we have reached a working basis with our County Commissioners, for relief work—quite largely in agreement with the state relief schedule.

On April 13, Dr. L. W. Larson, of Bismarck, presented before our society an illustrated address on "The Difficulties in Diagnosis of Malignancy." This informative paper was much enjoyed, and we had as guests many members of the Stutsman County Society, and several other doctors of our part of the state.

A fine spirit of fraternity prevails within our society.

Respectfully submitted,

F. L. Wicks, M. D.,
Councillor.

Sixth District

During the past year four meetings of the Sixth District Medical Society have been held. The attendance has been excellent and much praise is due to many members who came long distances to attend. There are fifty-six members in good standing and one member who has not paid his 1934 dues.

New members admitted during the year are: Drs. W. G. Rogne, McClusky; Maysil Williams, Bismarck, and A. E. Hetzler, Mandan, who transferred his membership from the Southwestern District Medical Society.

The finances are in good condition and all bills are paid.

The speakers from outside our district who participated in our program were Professor Bryng Bryngelson, of the University of Minnesota; Professor William Peyton, of the University of Minnesota, and Mr. Scott Cameron, attorney at law, Bismarck. The meeting in March was given over to a symposium on cancer of the breast. The April meeting was a joint meeting with the North Dakota State Health Officers Association, who held their annual meeting in Bismarck. The December meeting was devoted to a consideration of the recommendations of the State Economic Committee. Its plan was unanimously adopted and committees from the society appeared before the Boards of Commissioners of the eleven counties in our district. The plan has been adopted by five counties and seems to be working satisfactorily, with minor difficulties to be adjusted. The other six counties are reported to have made special contracts with one member of our society in spite of his promise to abide by and accept the recommendations of the State Economic Committee. Our society will undoubtedly take some action in regard to this matter before long.

The year has brought to the medical profession of our district many difficult economic problems. A number of local health and accident societies, who were trying to induce the doctors to accept reduced fees for their services, have ceased to exist; but others have sprung up. They persist in informing their members that they can obtain medical and surgical services for less than the usual fees. However, there seems to be a growing conviction among the members of these societies that good professional services cannot be obtained for little or nothing.

I wish to express my thanks to my fellow practitioners who have co-operated so well during the economic crisis, and especially to Dr. H. A. Brandes, who has given freely of his time and counsel in connection with the State Economic Program.

Respectfully submitted,

N. O. Ramstad, M.D.,
Councillor.

Seventh District

Five regular meetings, two special meetings. The latter were called due to the medical economic situation.

We have had an average attendance of twenty throughout the year. This includes our membership as well as the visitors. We have been particularly fortunate in having many of the doctors from the surrounding towns visiting our meetings, especially Valley City, Edgeley and Kulm.

Our meetings have been very interesting and instructive.

The speakers at our meetings have been Dr. Claude F. Dixon, Rochester; Dr. Fred Willius, Rochester; Dr. Peyton, Minneapolis, and Dr. Harold Swanberg, of Quincy, Ill., and Dr. Kepler, Rochester.

We have a total membership of twenty-two, of which number we have seventeen in good standing. The remaining five, for some reason or other, have been unable to pay their dues, possibly the economic situation prevailing has been a deciding factor, although I am inclined to believe that it is simply an omission or carelessness.

We added one new member to our society, namely,

Dr. Bertha Brainard, who, I am sure, will prove to be a valuable member of our local and state society

Our year has been uneventful, excepting the medical economic situation and poor relief, which condition prevails throughout the state and nation.

Respectfully submitted,

P. G. Arzt, M. D.,
Councillor.

Eighth District

The Medical Society of the Eighth District has held several well attended meetings during the past year. The principal subject discussed at these meetings has been the ever increasing amount of work demanded from the members in caring for the county poor, and in general the inadequate recompense received for it from the counties. Delegations from the society met with the Boards of County Commissioners of the various counties in our district with varying success. Some counties have been very fair, and have adopted the fee schedules we presented, others to date have not so complied.

Respectfully submitted,

Lee B. Greene, M. D.,
Councillor.

Ninth District

At the present time we have twelve paid up members in our society—with five in the district that have not paid their membership dues, but have previously been paid members. We have gained one member in Dr. Klein, of McHenry.

During the year we have had four meetings, one at San Haven, where we were entertained and instructed by the staff of the Sanitarium with demonstrations in pneumothorax and x-ray of the chest, followed by an excellent luncheon. One held at Fessenden, where the subject for discussion was medical economics; two at New Rockford, where the medical practice bill of the state and cancer were discussed. At the other meeting eugenics, or contraception and state sterilization, were discussed. Another meeting is contemplated.

The meetings have not been too well attended, but interesting subjects, as well as timely ones, have been discussed.

I was requested to bring before this Councilors' meeting the question of sterilization of indigent and defective individuals, on account of the increase of the undesirables in a stable government. The defectives, criminal neurotics, and lawless defectives are increasing in such a ratio, filling our institutions to overflowing, being neither of value to the state, to themselves or to society, and propagating with such rapidity, that it is becoming necessary that some way be devised that they cease their propagation. It is our opinion that sterilization is a sane and humane means of curtailing such propagation, and that some workable law should be devised to such an end.

When the question of the prevalence of tuberculosis was discussed at our meeting a motion was made, seconded and carried that the following suggestion be presented to the State Society: That all hospitals of the state routinely use the tuberculin test on all admissions. This would undoubedly lead to the diagnosis of many incipient cases which otherwise might not be detected for some time.

We recommend this, as it would greatly aid in eradicating tuberculosis.

Respectfully submitted,

Edwin L. Goss, M. D.,
Councillor.

Tenth District

During the past year the Southwestern District Medical Society has held four meetings, with an average attendance of eighteen members and three guests.

Our programs have been interesting, instructive and well received. The guest speakers for the year were: Dr. A. D. McCannel, of Minot, and Dr. J. A. Evert, of Glendive, Mont.

There are twenty-six practicing physicians in our district, and all of them are members of the Society, giving us 100 per cent membership.

We have lost three members during the year: Dr. J. V. Neville has moved to Forsyth, Montana; Dr. A. E. Hetzler has located in Mandan and transferred to the Sixth District; Dr. W. G. Wendell, of Marmath, died in June, 1933.

The economic phase of the practice of medicine has had an important place on our program. The local benevolent society problem has been disposed of, we hope, permanently; and the relief work for indigents was handled in a very satisfactory manner by our local committee on medical economics.

The spirit of co-operation and friendship among our members is very commendable and increases the pleasures and benefits of belonging to the society and attending its meetings.

Respectfully submitted,

A. E. Spear, M. D.,
Councillor.

REPORTS OF COMMITTEES

Committee on Hospitals

Dr. V. J. LaRose, Chairman, stated that the Committee had no report at this time.

Committee on Public Health

Dr. Maysil Williams, Chairman, presented the following report:

The Committee on Public Health of the North Dakota State Medical Association beg to submit the following report and resolutions:

Whereas, The North Dakota Legislature of 1932 reduced the appropriation for the State Health Department such a degree that the minimum essentials for a State Health Department cannot be maintained, be it therefore

Resolved, That the State Medical Society petition the next Legislature to increase the

appropriations to the State Board of Health sufficiently to permit the operation of the basic duties of the State Health Department.

Whereas, There has been and is still in progress a National Child Health Recovery or Maintenance program which was initiated by the Secretary of Labor, Washington, D. C., in October, 1933, be it therefore

Resolved, That the North Dakota State Medical Society lend its co-operation and support to this program.

Whereas, Many open cases of tuberculosis are being returned to their localities following residence at Dunseith, many of these to homes where adequate protection to other members of the family cannot be maintained, be it

Resolved, That before such cases are released from the Sanitarium an investigation in the local community will show that others in the community will not be endangered by the release; also since many of these may be rendered non-infectious by surgical treatment, some provision be made at the Sanitarium to provide such surgical treatment in selected cases, and that this Society go on record as favoring such a program.

Whereas, Advisory Health Committees to the County and City Boards of Health are being organized by the Counties and Cities of the State, it is desirable that the Medical Society lend its co-operation and guidance in working out a Public Health program for such counties.

Whereas, There has been a Federal Emergency Relief Program which is providing for immunization against diphtheria and vaccination against smallpox that the State Medical Society take definite action as to the responsibility of carrying out the provisions of this program.

Respectfully submitted,

(Signed) Maysil M. Williams, M.D.,
Chairman.

The President: Dr. Williams' report contains a great many things of interest and I think it well to appoint a committee to consider the report, and recommend its adoption with certain limitations, perhaps, in regard to the immunization factor.

Dr. G. M. Williamson introduced Dr. Walter L. Bierring, President-elect of the American Medical Association, and President Bowen requested him to give a brief outline of their experience along public health lines in Iowa.

Dr. Bierring stated that good co-operation between the state board of health and the state medical society in every state is very necessary. Their health department has endeavored to follow the suggestion of Dr. Williams, of having a rather small department with only the necessary department heads, and with additional stenographic help they have gotten along very well. During the past year the plan of co-operating with the state medical society has developed more than ever before, and this has been done through the Committee on Child Health and Protection. They have an agreement with the committees of the state society that they will not issue any literature that is not approved by them. Operating through the Committee on Health Education and the Speaker's Bureau, they are glad to co-operate in any post-graduate course, any system of clinics, but this must only be done with the approval of the county medical societies. When the Parent-Teachers' Association or any other organization requests speakers they are referred to the proper county society.

In the immunization work, they have a state appropriation which furnishes immunizing, and they use the so-called group immunization plan. If any county wishes to have an immunization plan carried out they determine where it shall be and then send to the Board of Health for consent blanks. There are two kinds of blanks, one providing that physicians designated by the county society shall do the immunization, and the other that their private physician shall do the work. The Board of Health tries to see that the immunization shall be as complete as possible. They agreed to furnish one-half the immunization material free, the other half to be furnished by the community, but if toxoid is used they furnish one-third of the amount required. They try to emphasize the point that the sponsoring body, whatever it may be, shall so arrange the plan that enough immunizations will be paid for so that there will be a fund to pay the physicians a reasonable fee for their work, either on an hourly basis or a definite amount for each immunization. The usual charge has been fifty cents for each case. They are trying to get away from the idea that preventive work is done for sweet Charity's sake, and urge particularly that the physicians who do such work shall have some remuneration. They hope that gradually more and more patients will go to their private physicians and it will no longer be necessary to furnish the material.

They have a very active legislative committee, which is a great help. It reports back to the state society and only those measures that are approved by the society are pushed.

Dr. Bierring expressed the opinion that a great deal had been accomplished in North Dakota,

and urged that in any of the agencies the society might contact with them to try to preserve organized medicine, for upon the manner in which organized medicine handles these affairs depends the future of organized medicine.

He felt that the individual physician should become more interested in public health, that there is no need for full time health officers, for part time officers can do the work just as well, and the maintenance of health should be just as much the function of each practicing physician of the future as the cure or treatment of disease. In all matters of health administration the members of the local society should participate, and by the constant integration of public health work and the private physician will be preserved the real function of the practicing doctor.

This question was further discussed by Dr. Frank I. Darrow, and Dr. Bierring.

President Bowen thanked Dr. Bierring for his remarks, and appointed the following committee to review the report of Dr. Williams and make recommendations: H. A. Brandes, Chairman; John Crawford; L. B. Greene; A. E. Spear, and A. R. Sorenson.

Committee on Medical History

Dr. G. M. Williamson reported informally that Dr. Grassick had collected quite a good deal of valuable material which was ready for publication at some future time. He further stated that there were still available some copies of the first volume of the Medical History of North Dakota, and that they would be glad to dispose of them at a reduced price.

Necrology Report
1934

The following report was presented:

Your Committee on Necrology consisting of the members of the Council hereby submit their annual report.

We are indebted to our honored and beloved Historian, Dr. James Grassick, for preparing this report.

Lee B. Greene,
G. M. Williamson.

It is with regret that we intrude a discordant note in a gathering where business, scientific discussions and good fellowship are so much in evidence. This, however, seems to be inevitable, for the same chimes that joyfully announce the birth of a new life, in a few short years at most will dolefully toll the fact of its passing. Let us, therefore, reverently pay this one tribute to the memory of those of our number who so recently went in and out amongst us, who did their day's work, "Even as you and I"; but who have now ceased from their labors.

GILBERT DOWNS TODD

Dr. G. D. Todd was born in New York City and came to Minneapolis in 1891. He graduated from the Medical Department of the University of Minnesota in 1903, and was licensed in North Dakota in October of the same year. He established himself at Medina and there continued to practice his profession until 1929 when he went to Litchville, North Dakota. Here he remained for the remaining years of his life, passing away August 21, 1933 at the age of 53 years.

HERMAN R. GUNDERMANN

Dr. H. R. Gundermann was born in Gotha, Germany, January 13, 1863 and died at Monango, North Dakota, August 4, 1933. He graduated from the high school of his native city, and emigrated to America when 17 years of age. He afterwards entered the College of Physicians and Surgeons of St. Louis, Mo., from which he graduated in 1887. He practiced for two years in Wilbur, Neb., and for twenty-six years in Bangor and Selby, South Dakota. He located in 1915 in Monango, North Dakota, and was licensed in 1916. He remained there in active practice until the time of his death.

Dr. Gundermann was essentially a pioneer doctor, giving his time and skill disinterestedly for those he served. He had served on his town board, school board and in other official public capacities and at the time of his death was President of the Southern District Medical Association.

GEORGE D. GERTSON

Dr. G. D. Gertson died at Tucson, Arizona, November 20, 1933, at the age of 37 years. He received his Bachelor of Science Degree from the University of North Dakota in 1924 and graduated in Medicine at Northwestern University, Chicago, Ill. He interned in the U. S. Naval Hospital at Boston, Mass. In 1927 he became associated with Dr. Thos. Mulligan of Grand Forks, North Dakota. In 1932 failing health made it imperative that practice be discontinued. A close friend pays this tribute to his memory. "Dr. Gertson was held in the highest esteem by his professional associates as evidenced by election to the presidency of the Grand Forks District Medical Society for 1932. He was an ideal practitioner, studious and human, and was a friend as well as a physician to his patients."

JOSEPH C. SUTER

Dr. J. C. Suter was born of Irish parentage at Carleton Place, Ontario, October 5, 1864, and died at his home in Grafton, North Dakota in 1933. He received his education in Canadian schools and graduated from Trinity College, Toronto, 1891. He immediately came to North Dakota, was licensed to practice in May of the same year and located at Crystal, North Dakota, where he was associated with Dr. Robert Archer, a classmate, and later with Dr. Hugh S. Wilson. In 1907 he went to Vancouver, B. C., where he remained for a year. Returning he became a partner of Dr. J. C. Countryman of Grafton. He remained a member of the firm until 1930, when he was forced to retire by reason of failing health.

Dr. Suter was closely identified with local, state and national medical societies, and was a Fellow of the American College of Surgeons. He was also a member of the North Dakota Board of Medical Examiners and consistently kept abreast on modern medical thought by taking graduate work at various times in Chicago, New York and elsewhere.

Dr. Suter was a type of the conscientious Doctor who lived up to his high ideals of professional service and who spared not himself in giving his patients all that his ripe scholarship and experience had to offer. In his life and conduct as physician, friend and citizen, he made a lasting contribution to the finest traditions of the profession he so loved and honored.

GUDMAN J. GISLASON

Dr. G. J. Gislason was born in Iceland, January 21, 1877, and passed away at his home in Grand Forks, January 3, 1934. He came with his parents to what is now North Dakota in the summer of 1883 and thus for a full half century was in close touch with life on its prairies, which incidently he loved so well. He received his early education in the schools of his home county, Pembina, and took academic studies for three years at Wesley College, Winnipeg. He later secured his B. A. Degree from the University of North Dakota.

Dr. Gislason graduated in Medicine from the University of Illinois in 1904, and was licensed to practice in North Dakota in the same year. He then established an office in Grand Forks, North Dakota, where he afterwards continuously resided with the exception of time spent in graduate study at home and abroad. He was a Fellow of the American College of Surgeons and was elected first President of the North Dakota Academy of Ophthalmology and Otolaryngology in 1919. He also held the position of President of the Grand Forks District Medical Society. His practice was confined to eye, ear, nose and throat, perfecting himself in these subjects by intensive and prolonged study in Vienna, Berlin, London and Edinburgh.

Dr. Gislason was an unusual character in many ways. He had a rugged personality and a nobility of character that was outstanding. He faced facts as he saw and interpreted them with force and determination. No one remained long in doubt, as to where he stood, when any matter was up for discussion.

He loved his native land, its people and its institutions and rejoiced in the contributions they have made to the world's progress. In acknowledgment of his interest and ability he was appointed by Governor Shafer of North Dakota as his official representative to the Millenium Celebration of Representative Government in Iceland in 1930. He was an earnest student of Icelandic literature and made many excellent translations from his native tongue into English. At the time of his demise he had in preparation a life of Lief Ericson. There had also appeared in leading periodicals at various times from his pen, original poems of much merit.

As a physician he was accomplished and skillful; as a citizen he took an active interest in the affairs of church and state and stood for the best in civic and community life; as a friend and associate he was genial, honorable and dependable; and in his home life he was considerate, sympathetic, kindly and affectionate. He was at his best, with family and friends around his own fireside.

In the passing of Dr. G. J. Gislason the profession loses an honored member, the state a loyal citizen, his church a faithful adherent, society a cultured gentle man and his family a devoted husband, father and homemaker.

THOMAS S. PRYSE

Dr. Pryse was a pioneer physician of Dawson, Kidder County, where he practiced his profession for thirty years.

He was a graduate of the University of Louisville, Kentucky, and was licensed in North Dakota, 1903.

He died at Bismarck of heart disease October 23, 1933, aged 61 years.

For several years he was a member of the Sixth District Medical Society, but recently allowed his membership to lapse.

The early settlers of Dawson and the sur-

rounding county bear testimony that Dr. Pryse could always be depended upon to give the best he had of skill and service to those who came to him for aid.

The old family physician is passing, one by one, and few there are who seem willing to step into the gap. Good roads and modern transportation facilities are slowly but surely eliminating the small wayside town, and everything that is in it; and the Country Doctor is becoming but a memory.

HARRY F. EMERT

Dr. H. F. Emert, was born January 2, 1886, and died at Devils Lake Hospital, May 7, 1934.

While attending to the duties of an arduous country practice, he was stricken with that dread enemy of mankind, pneumonia, and in spite of all that care, knowledge and skill could do, the flower of life was extinguished—and that too when he was just entering that period of his professional career when much might have been expected.

Dr. Emert was a graduate of the University of Minnesota and was licensed in North Dakota, July 12, 1912. He was a practicing physician at Sarles at the time of his death, and was recognized by his fellows as a worthy representative of his profession.

He was a good student, a tireless worker, and a splendid physician. He was associated with the usual divisions of organized medicine in District, State and Nation, and was at the time of his death President of the North Dakota State Board of Medical Examiners of which he had been a member since August, 1928.

He leaves a widow, who was before her marriage, Miss Pearl Ferris, daughter of a prominent pioneer of Nelson County.

Dr. Emert is remembered as a physician of energy and ability, as a citizen who had the welfare of his community at heart, and as a friend and neighbor who was respected and honored.

Dr. Williamson moved that the report be accepted.

The motion was seconded by Dr. Paul H. Burton and unanimously carried.

Committee on Medical Defense

No report was presented.

Committee on Medical Economics

Dr. H. A. Brandes, Chairman, presented the following report:

The Committee on Medical Economics was formed on September 11, 1933, when the State President, Dr. J. W. Bowen, named to the Committee the following members:

Dr. Paul H. Burton, Fargo.
Dr. Robert Campbell, Grand Forks.
Dr. W. H. Long, Fargo.
Dr. A. D. McCannel, Minot.
Dr. E. A. Pray, Valley City.
Dr. C. E. Stackhouse, Bismarck.
Dr. H. A. Brandes, Chairman, Bismarck.

The Committee was instructed to prepare a plan for the care of county patients and to submit recommendations as to the action to be taken against the newly organized health or benefit organizations that have been attempting to exploit the profession.

Being a new committee, it was necessary to secure material for study and with the postponement of two scheduled meetings because of bad roads and weather conditions there was delay of several weeks before we met for the first time in Valley City on November 19, 1933.

Medical Relief Plan

At our first meeting the Committee decided to confine its work to the preparation of a plan for the care of the sick indigent and unemployed. After a careful study of medical relief programs in other states and the regulations for medical care as provided for in the F. E. R. A. pamphlet No. 7, we prepared a medical relief plan and minimum fee schedule, copies of which we are submitting with this report.

The plan formulated by your Committee follows closely the federal regulations for medical relief and should it become necessary to bring federal funds into the state for medical care, we believe that our plan will be readily accepted without change by the State Relief Administrator.

Much thought was given to the preparation of the minimum fee schedule for we had to consider not only the best interests of the profession, but that it was equally important to make the taxpayers' money go as far as possible in these days of economic distress.

Copies of the plan and fee schedule were mailed to every member of the State Association within ten days after our first meeting.

The Committee realizing that it was necessary to secure immediate acceptance of the proposed plan by the profession, in order to have the medical relief program presented before the Boards of County Commissioners at their December meeting, sent out telegrams on November 25, 1933, to the Presidents of the component societies requesting them to call a special meet-

ing for the purpose of taking prompt action on the plan and fee schedule.

Despite the short notice, all of the thirteen societies complied with our urgent request, and the plan and fee schedule were accepted, with only one or two minor exceptions as to fees, and presented at the December meeting of the County Commissioners throughout the State.

On December 17, 1933, the Committee held its second meeting in Bismarck to consider matters of importance which had developed since the previous meeting. This meeting was preceded by a luncheon and in attendance were the President of the State Association, Dr. Bowen, all members of the Committee (Dr. W. A. Liebeler of Grand Forks acting for Dr. R. D. Campbell), representatives from all component societies except four, and Judge Christianson, Mrs. Minnie Craig and Mr. A. E. Thompson, of the State Emergency Relief Committee.

A copy of the proceedings of this meeting, together with recommendations for the furtherance of our program, were mailed on December 19, 1933, to the Presidents and Secretaries of each medical society and to the Chairmen and members of all the newly created Local Committees on Medical Relief. We are submitting with this report a copy of the proceedings of the December 17, 1933, meeting.

We were able to obtain favorable publicity for our program through an excellent and well written article which appeared on the front page of the Bismarck Tribune in their issue of December 21, 1933. This article through the Associated Press appeared in the leading daily newspapers of our State.

Believing that this type of publicity was very helpful, copies of the Bismarck Tribune carrying the article were mailed to the entire membership of the State Association with the hope that they would make use of the article in their local newspapers.

An excellent editorial favorable to our program appeared in the same newspaper (Bismarck Tribune) on January 2, 1934, and we believe it was of much help in having the medical relief plan adopted in Burleigh County.

Copies of the Bismarck Tribune carrying the article and editorial are filed with this report.

Meetings Attended

The Chairman of the Committee, on invitation from the State Association of County Commissioners, presented the proposed plan at their meeting in Fargo on January 10, 1934. About 100 commissioners were present, and much interest was shown in the discussion that followed. We trust that our presentation of the subject may have been of some help in furthering the medical relief plan in the State. While the members of the Committee are only too glad to give any assistance that may be requested by local societies, they fully realize that the acceptance or rejection of the plan depends to a very large extent on the manner in which the proposed plan is presented to the County Commissioners by the members of the Local Medical Relief Committee and to the co-operation and support of the entire membership of the Society.

The Chairman of the Committee attended the Northwest Medical Conference held in St. Paul on February 25, 1934. This meeting was devoted entirely to papers and discussion on medical economics, relief programs, radio broadcasting, hospitals and kindred subjects which proved interesting and profitable.

Reports on Questionnaires

Your Committee regrets that it is not able to give a complete report on the results of our work as twenty counties remain unreported to questionnaires sent out February 7, February 17, March 1, and May 15, 1934. Reports received up to the present time indicate that our plan is in effect in twenty-eight counties as follows:

Barnes (with slight modification of fee schedule), Bottineau, Benson, Billings, Bowman, Burleigh, Cavalier, Dickey, Emmons, Hettinger, LaMoure, Logan, McIntosh (slight modification of fee schedule), McLean, Mountrail, Nelson, Pembina (50 per cent of usual fees), Ramsey, Renville, Rolette, Sargent (50 per cent of usual fees), Stark, Slope, Steele (some modification of fee schedule), Traill, Towner (North half of County), Wells (1929), Ward.

Morton County adopted the plan and fee schedule on January 1, 1934, but on March 1, 1934, returned to their former county physician set-up because of depleted funds. The Commissioners have agreed to include in the budget for the coming fiscal year sufficient funds to permit them to accept our plan beginning July 1, 1934.

The Medical Relief Committee for Adams County reports that "the commissioners are willing, but the physicians cannot agree."

The following counties rejected the proposed plan:

Cass, Eddy, Foster, Grand Forks, Grant, Griggs, McHenry, Pierce, Stutsman.

Richland—increased salaries from $1,075 to $2,000.00.

Counties rejecting the plan and entering into contract with physicians for treatment of all hospital cases are as follows:

Dunn, Kidder, Mercer, Oliver, Sioux, Sheridan.

We understand that the Mandan Clinic (conducted by Dr. G. H. Spielman and associates) has contracted with the above six counties to treat and care for all patients requiring hospital treatment at the rate of $500.00 per annum.

This agreement brings up the problem of contract practice with all its abuses, and the Committee recommends that immediate action be taken by the State Association and component societies to curb this vicious practice in our State.

The seven counties remaining unreported are are as follows:

Burke, Divide, Golden Valley, McKenzie, Ransom, Walsh, Williams.

The Committee recommends that renewed efforts be made in the counties that have not accepted our proposed plan. It is suggested that the Local Medical Relief Committees in these counties again present our program before the County Commissioners at their June meeting with the request that the county officials set aside sufficient funds in the budget for the coming fiscal year beginning July 1st that will permit of the acceptance of our relief plan.

C. W. A. and U. S. Employees' Compensation Commission

During the latter part of December, 1933, we were called upon by physicians in the State, to protest the regulations of the U. S. Employees Compensation Commission which barred the free choice of physicians by employees injured on C. W. A. projects. Your Committee immediately took up the matter with members of the State Relief Committee, by telegraph with the Secretary of the A. M. A., and through the Chairman of the State Legislative Committee with our Senators and Congressmen in Washington, but, as most of you know, the medical profession was unsuccessful in its efforts to have the rules amended to permit of the selection of the physician by the injured employee. Since the discontinuance of the C. W. A. program, the men now injured on relief projects receive care and compensation from the North Dakota Workmen's Compensation Bureau.

Federal Relief Activities

On January 2, 1934, Judge Christianson, Chairman, of the S. E. R. C. (now State Relief Administrator), appointed your chairman to the State Relief Organization's subcommittee on health. Briefly, this subcommittee is an advisory one and makes recommendations to the State Relief Administrator on all matters pertaining to medical, nursing and hospital care of a relief nature requiring federal funds. Although the work of this committee has taken no small part of the time of your chairman, it has been of great value to have this contact with the Relief Administrator's Office in keeping informed on the rapidly changing conditions as they affect the medical profession.

There is under consideration at the present time a project for corrective work in children of pre-school and school ages whose parents are on relief rolls, and we believe that federal funds will be made available, in the very near future for correction of physical defects.

This subcommittee, after having a rapid survey made by physicians and dentists of 400 children of pre-school and school ages in rural districts, estimated that approximately $600,000.00 will be required in the State for corrective work in children of parents on relief rolls and borderline cases. Approximately one-half of this sum will be needed for correction of dental defects. Our minimum fee schedule was used as a basis for determining the amount of money required for medical corrective work.

A state wide program for immunization for diphtheria and smallpox has been before the subcommittee several times and it has been tentatively arranged for mass immunization to be carried out in the children of parents on relief rolls and borderline cases in those counties requesting federal funds for the prevention of diphtheria and smallpox. It was agreed by members of this committee that pending the action of the State Medical Association, the children of parents able to pay would not be permitted to avail themselves of this service. These children will be advised to see their family physicians. The work is to be done under the direction of the City and County Health Officers and physicians participating in the work will be paid at the rate of $10.00 per day. The subcommittee felt that immunization of 150 to 200 children should be considered a day's work. The plan is to have several collecting centers in each county where the children would be gathered in groups of 150 to 200. This arrangement would save time and reduce travel expense. The county is expected to pay the latter item.

The State Relief Administrator of federal funds, up to the present time, has not deemed it wise to designate federal funds for medical

care to the indigent sick and unemployed in our state.

Expense of the Committee on Medical Economics

The Committee incurred some expense in its work and is submitting herewith an itemized statement in the amount of $89.35 covering all expenditures except travel expense of the members to the Valley City and Bismarck meetings.

All bills listed in the itemized statement have been paid by the Chairman of the Committee.

It may be of interest to mention that the Committee sent out more than 700 pieces of mail and twenty-five telegrams and received slightly more than 100 letters and about fifteen telegrams.

The Committee wishes to express its sincere appreciation to the President and Secretary of the State Organization, to the officers of the component societies and to the chairmen and members of the Local Medical Relief Committees for their wholehearted co-operation and support in the work we have undertaken in the State to protect the interest of the medical profession.

Respectfully submitted,

Paul H. Burton, M.D.
Robert Campbell, M.D.
W. H. Long, M.D.
A. D. McCannel, M.D.
E. A. Pray, M.D.
C. E. Stackhouse, M.D.
H. A. Brandes, M.D.
Chairman.

This report was discussed informally by Drs. Weed, Leigh, Crawford, Sorenson, Williamson, MacLachlan, Ramstad, and McCannel.

Dr. John Crawford expressed the opinion that the Association had better go on record and let the United States, the state and the county officials know that the medical man does not live on charity. The United States is able to take care of the poor and feed them, and should pay for everything the medical man does along the same line.

Dr. A. R. Sorenson stated that Dr. Brandes had presented a splendid report, and felt that the reason that physicians were not getting any money for a lot of their work was because there is no money in the county treasuries. He thought that the suggestion that a committee be appointed from this Society to study this question was a good one, and that the Society should go on record as favoring whatever the Committee recommended so as to hold the men in line, as a lot of men will jump out of line for the sake of getting a small amount of money. Keeping them in line would work for the best interests of all concerned.

Dr. Charles MacLachlan moved that a committee of three be delegated by the Chair to act as an Executive Committee in accordance with the recommendations made by Dr. Brandes, preferably from near the State Capital, where they could conveniently meet.

He felt that if the By-Laws did not empower such a committee they should be amended.

Dr. A. R. Sorenson seconded the motion and offered as an amendment that the committee consist of five members from different sections of the state, as it might be easier to get a majority of the committee together for a meeting.

Dr. G. M. Williamson expressed the opinion that this question was as important a matter as could come before the House of Delegates, but suggested that they lay the matter over until the meeting of the House on Monday, to allow an opportunity to look over the Constitution and By-Laws to see if it could be arranged to amend them to make such action authoritative.

Dr. N. O. Ramstad agreed that it would be well to wait for the next meeting for definite action, to allow consideration of a practical method of working the matter out.

Dr. A. D. McCannel complimented Dr. Brandes on his splendid report, but sounded a word of warning to the component societies that things were not as rosy as the report indicated. Many of the county commissioners have promised to go into the matter and make an increased levy. He felt that he could speak for Ward County that this would take a lot of work. He felt that many of the counties would say that this would cost so much more than they expected that they would think it was not workable, and it would mean a tremendous amount of work in the counties that are on the plan to get the commissioners to make the increased levy, for medical care has more than doubled in many counties.

Dr. MacLachlan moved that there be an expression of opinion as to the desirability of having a committee appointed by the Chair to further consider this report.

The motion was seconded by Dr. Sorenson and carried by a rising vote.

President Bowen appointed the following as a committee to review this report: Drs. Charles MacLachlan, Chairman; A. D. McCannel, A. P. Nachtwey, A. R. Sorenson, and John Crawford.

Dr. Williamson moved a vote of thanks to Dr. Brandes for the vast amount of work he had done in connection with this committee, and for the splendid report he had presented.

The motion was seconded by Dr. MacGregor and unanimously carried.

Committee on Medical Education

Dr. H. E. French, Chairman, presented the following report:

Your Committee on Medical Education would report as follows:

1. The School of Medicine at the University: Organization and plan are well known to you. Along with reduced salaries and budgets for supplies and equipment the school had more demand for admission on the part of qualified residents of the state last year than ever before. After attempting to hold the admissions to the first year class to about thirty, the school was urged by the Governor, the Board of Administration, and the President of the University to take more, at least up to the demand from the State, and in order that this might be done the school was promised a little more in equipment budget, and one additional small salary for 1933-34, and two such salaries for 1934-35. The final enrollment in the first entering class was forty-three. The size of rooms, the size of staff and the amount of equipment, however, make an entering class of thirty far more satisfactory. It is too early to say what the admissions for next fall will be, probably not quite so large, but the demand is large. It is to be hoped that the admissions need not be so large again. In spite of handicap, however, the usual efforts have been made, and with seemingly the usual results. The members of the second year class are transferring to other schools for their clinical work to as good advantage as ever. Of the class of twenty-five Rush is taking eleven, and offered to take a few more. Northwestern is taking eight and offered to take one more, Pennsylvania is taking two, and Creighton and Georgetown are each taking one, leaving only two at the lower end of the class unplaced at this time.

2. Popular Health Education: The Committee is less in contact with all that is going on. In the year a Committee on Cancer Prevention was organized. The State Department of Health and the North Dakota Tuberculosis Association have carried on. The Chairman of the Committee has attempted a broadcast on some popular health subject once each week from October to June.

Respectfully submitted,

H. E. French, M. D.,
Chairman

Committee on Cancer Survey in North Dakota

Dr L. W. Larson, for Dr. Eric P. Quain, presented the following report, and moved its adoption:

The House of Delegates of the North Dakota State Medical Association at its meeting in Valley City last year established a Cancer Committee at the request of the American Society for the Control of Cancer. The members appointed on this Committee were:

E. P. Quain, Chairman, Bismarck.
Frank I. Darrow, Fargo.
Russell Gates, Minot.
H. E. French, Grand Forks.
L. W. Larson, Secretary, Bismarck.

The Society mentioned requested that the profession take more interest in cancer than it had done in the past and offered its services for the furtherance of a program, the purpose of which was to lower the cancer mortality in our State. The majority of the United States had already taken up this activity and statistics available indicate that the cancer mortality shows a decrease in those localities where this work was first begun several years ago.

The first activity by the Society for the Control of Cancer was to make a survey of the State. For this purpose Dr. John M. Flude, a national director of the organization, visited our State last September and met with the members of the Committee. He stressed the importance of trying to arouse the profession into a more intense study of cancer and advised that cancer of the breast be stressed in all our local societies during the year. He sent a questionnaire to all the hospitals of the State for information regarding their facilities for handling cancer. As yet, he has not obtained sufficient replies to give a definite report.

Your Committee has tried to follow out the recommendations of the National Society and to this end sent a circular letter to the Secretary of each district society outlining the program and urging that one meeting of each society be devoted to the subject of cancer of the breast. Recently, we wrote to all the secretaries to determine the response to our suggestion for such meetings. We found that such meetings had been held in Fargo, Valley City, Jamestown, Bismarck, Carrington and Devils Lake. Traill-Steele District Society plans to have such a meeting in July. Six of the thirteen societies, therefore, have had such meetings, while one is to be held in the near future.

A second recommendation from the National

Society was to begin a program of education for the public, calling attention to some of the earliest signs and symptoms of malignancy in order that the patients may call on their physicians for advice while the disease is still in its curable stage. This part of the program has been attended to in a limited measure by talks before several women's organizations and also before a few Rotary Clubs.

Plans for the future will be to continue the keeping up of the study of cancer within the district societies and also to enlarge the activities for public education. This is to be done through public meetings, various clubs, suitable literature and perhaps radio talks and newspaper articles. We have found that the public is keenly interested in this activity and that the best newspapers are always ready to print articles on the subject. Broadcasting stations can also be counted upon to assist, if we furnish the proper information and talent. These last mentioned activities may take a little money, but it is our belief that the State Association should back this up financially to a reasonable amount. The question of how to manage and authorize newspaper articles and the radio talks is not yet solved, but we believe that in time a way will be found which will be practical, useful and prove to the public that we possess the altruistic principles we have proclaimed since time immemorial.

Respectfully submitted,

E. P. Quain, M.D.
Chairman

The motion to adopt this report was seconded and unanimously carried.

Dr. Murdock MacGregor moved that the House of Delegates temporarily adjourn until 8:00 p.m.

The motion was seconded by Dr. Williamson and unanimously carried.

President Bowen declared a recess and the House of Delegates adjourned at 6:10 p.m. to reconvene at 8:00 p.m.

EVENING MEETING

The adjourned meeting of the House of Delegates was called to order at 8:15 p.m., by the President, Dr. Jesse W. Bowen.

Report of Committee on Scientific Program

Dr. W. H. Long, Chairman, stated that the program constituted the report of this Committee.

Dr. G. M. Williamson moved that the report be adopted and the program made official.

The motion was seconded by Dr. Nachtwey and unanimously carried.

Editorial Committee on Journal-Lancet

Dr. N. O Ramstad, Chairman, stated that Mr. M. E. Herz was present and requested for him the privilege of the floor.

President Bowen invited Mr. Herz to explain briefly the new plan they had in view.

Mr. Herz explained that during the past two years The Journal-Lancet had added about six special issues a year, with out-standing men in their special field writing special articles for these numbers. It was necesary to plan these issues about eight months in advance of publication in order to allow the essayist time to prepare their papers. He felt that this had added greatly to the value of The Journal-Lancet.

In order to develop a better journal editorially and in every way, they would like to have a five year agreement with the societies that they officially represent, as they could then work much more advantageously and economically. The South Dakota Association has already accepted the plan.

President Bowen thanked Mr. Herz for his explanation and referred the matter back to the Committee for their consideration and report at the meeting of the Council on Monday.

Committee on Public Policy and Legislation

Dr. L. W. Larson, Chairman, presented the following report:

During a year in which the State Legislature does not meet, your Committee has few duties. Its work has consisted mainly of assistance to the Committee on Economics and the legal department of the Board of Medical Examiners. On January 27th a telegram was sent to our senators and representatives in Washington at the request of Dr. E. H. Cary, Chairman of the Legislative Committee of the American Medical Association, and which read as follows:

"In your way please wire today your senators and congressmen that your organization favors presidential economy program regarding benefits to veterans with service connected disabilities but opposes free medical care and hospitalization to non-service connected cases unless indigent which should remain with local physicians and hospitals regardless of governmental compensation."

Replies were received from all of them, in which the regulations of the U. S. Employees' Compensation Commission were restated and reaffirmed, but little expression of opinion on the veterans' problem was obtained. Evidently, they all wished to dodge this issue.

The Chairman of your Committee attended the Northwest Medical Conference in St. Paul on February 25th where a number of good papers and discussions were heard on subjects of vital interest to the profession and its relation to the public. It was quite evident that other states have had as much and possibly more grief than we have. It was also evident that our state compensation law is about as satisfactory as it could be, judging from the difficulties they have had with somewhat different plans in other states.

In looking to the future it is rather difficult to know just what course to follow. If the economic situation in our state remains the same or becomes worse, some form of state medicine will not only become likely, but the financial situation of many of our fellows will become very precarious. Every attempt must be made to maintain the patient-physician relationship. Fortunately, there has been a very cordial relationship between our profession, mainly through its Economic Committee, and the State Federal Relief Committee. We are hopeful that this same feeling can be fostered on behalf of the next legislature and state officials. However, this can only be done by the whole profession working individually with its own representatives and senators, and co-operating to the fullest extent with the Legislative Committee during the next session. It is doubtful whether or not any aggressive legislation should be attempted next January and February, but we must be alert to the danger of damaging legislation sponsored by the irregulars. All of you are urged to act promptly, if and when called upon for help. Delay often means defeat.

This would seem to be a time when every physician must take cognizance of his responsibilities to himself, his profession and his fellow citizens. Laws are made by law-makers, but public opinion is the greatest force in molding those laws. If we as physicians can be trusted with mankind's most precious possession, health, we should be able to convince people of the necessity for the private practice of medicine and the proper remuneration for work done especially on the indigent sick. Every physician should consider himself a committee of one to encourage understanding and friendliness between the laity and our profession. To do this we must realize that times have changed and that our old idea of aloofness will not "get by" as it used to. Let us all conduct ourselves in such a way that the dignity of our profession may be upheld and the welfare of its members maintained. If we do, the problems of the Legislative Committee in 1935 will be greatly minimized and we will have little to fear in the future.

Respectfully submitted,

L. W. Larson, M.D.,
Chairman

Upon motion regularly seconded and carried this report was accepted as read.

Committee on Tuberculosis

Dr. Charles MacLachlan, Chairman presented the following report, which was read by Secretary Skelsey:

The Public mind does not readily reconcile itself to the assertion that the incidence of tuberculosis is steadily decreasing with the equally true statement that increased bed accommodation is demanded at the State Sanatorium for the care of its tuberculous. The explanation lies in the fact that the afflicted are becoming more and more sanatorium minded. Proof of this statement is demonstrated by recalling that when the Sanatorium was first opened for service, twenty plus years ago, only eleven patients presented themselves for treatment, while twice during the past two years with a patient population of 250, there were nearly sixty applicants on the waiting list.

This urge for increased room was partially but temporarily relieved last midwinter when there was opened for infirmary service a new building constructed and presented to the State by the Degree of Honor Protective Association equipped and housing twenty-two male patients;—a magnificent gift from the savings of twenty years and at a time when it was sorely needed.

This building was opened February 3rd, last, and given over to the use of adult male infirmary cases and the Masonic Cottage, also a gift from that body, which had for years been occupied by males was in August, 1932, turned over to female adults who in numbers are greatly in excess of the men patients at San Haven.

Appeals were made by the Superintendent for additional infirmary accommodation through the Budget Committee of the last two Legislative Assemblies but the handicap of tax payment delinquencies and consequent shortage of funds in the public treasury were too great to overcome, and we had to struggle along making additions to our waiting list and apologizing for lack of space. With the approval of the State including the Governor, the Attorney General, the State Health Officer, and the State Board of Administration, a regulation relative to the time a patient would be allowed San Haven care was fixed at two years while there continued to be a waiting list.

This was in the interest of fairness to those who, barred from admittance were being denied knowledge of the methods of self care and cure taking, but this regulation which is still in force has objectionable features in that some old fibrotic cases with cavitation who refuse surgical chest relief are discharged at the time limit and return to their communities positive and potent distributors of infection, not however without warning from San Haven to County Health authorities of their condition.

In this extremity, however, in November 1933, appeal was made with the approval of State Board of Administration to the P.W.A. Board, Headquarters Devils Lake, Chairman, Honorable S. J. Doyle, for the recognition of a project embracing a grant sufficiently large to construct and equip a third infirmary unit at San Haven in the amounts of $120,000 and $40,000 respectively. Chairman Doyle came up and surveyed the situation. The Committee of which Thomas Moodie, a candidate at present for a state office, was a member and Henry Holt, a candidate for a federal office was secretary, gave hearty endorsement to our request and for a time we felt encouraged, but this committee was dissolved, and the entire administration program of the F.E.R.A. in North Dakota was placed upon the shoulders of Honorable Justice Christianson of Bismarck.

We then renewed our appeal with the approval and support of the Governor and of the State Board of Administration, asking for $190,000 to construct and equip a ninety instead of a sixty-five bed unit as originally applied for. This time we went about it more methodically and in greater detail, covering every reasonable requirement in each department and amending our appeal also by a request for $50,000 for extension of power house construction, a new 200 h.p. engine and for the necessary extension of water, steam and sewage systems.

We have reason to feel greatly encouraged in our quest for with Justice Christianson it has the endorsement of the Governor, the Board of Administration, the State Health Officer and the State Tuberculosis Association, as well as the hearty support of some of the members of the profession here present. Is there, can there be, any reason why the North Dakota State Medical Association cannot as represented, here and now, pass a resolution strongly sustaining the necessity for the said grant.

Indisputable proof for its necessity is supported by a comparison of the Sanatorium beds provided by our neighboring Province of Manitoba and our sister State of Minnesota to the east, together with the waiting list already referred to. North Dakota with a population of 680,845 has 240 Sanatorium beds. Manitoba with a lesser population of 639,056 has 725 Sanatorium beds. Minnesota with a population of 2,563,953 has 2,488 Sanatorium beds. In other words, North Dakota with the twenty-two beds of the Gift Cottage if granted the increase of the ninety bed infirmary asked for would then have 352 beds—which would still be less than half the pro rata that Manitoba now has, or only about one bed for every 2,000 population while Minnesota has one tuberculosis bed for every 1,000 population.

Again we are put to shame by Manitoba's campaign strategy in its fight to overcome tuberculosis. Armed, their traveling clinic goes out to meet the foe in the field before he has become entrenched and attacks him when he is vulnerable. Here we wait for the afflicted to come to us, and such is the insidious nature of his attack that the patient is usually a far advanced case before he comes to the physician's attention. The travelling unit with old tuberculin and portable x-ray goes out and seeks the enemy by Mantoux and roentgen-ray, surprising him before he has gained a strong grip on his victim and by home —or Sanatorium—recommended care evicts him or walls him into his own self—destruction, while we allow him to infect and victimize our citizens unhampered, and go on providing more room to hive the poor devils in when they've reached the stage when little if anything can be done for them apart from chest surgery.

During the past year, Manitoba's Travelling Clinic skin-tested, examined and x-ray plated 5,500 contacts and chest suspects in addition to the work done in their provincial Sanatoria and in the diagnostic clinic at Winnipeg.

The Travelling Clinic reaches the greatest number of patients in the minimal or moderately advanced stages when arrest or a cure if at all possible can be accomplished. Again from an economic standpoint, arrest of the disease is accorded by such methods at a minimal expense and years of bedfast worry, suffering and expense bills saved.

The entire expense of this Travelling Clinic is cared for by the sale of Christmas seals without any extra burden to the tax payer. This clinic conducts its campaign co-operatively with the local physicans and health officials.

Why should we continue to falter in our fight knowing that a vigorous and well-planned campaign in the open field will defeat the enemy, sustained and encouraged as we are through the

knowledge that this is being successfully accomplished by our neighbors.

A report on the status of tuberculosis in North Dakota and of the results obtained at San Haven would be incomplete without a recital of certain statistics. Here we append the more important of these as follows:

San Haven Patient Population

May 25, 1933	221
May 25, 1934	251

Admittances

Adults	178
Children	27
	205

Condition on admittance of patients admitted between May 25, 1933 and May 25, 1934:

1. Pulmonary Tuberculosis (adult)	144
Far Advanced:	
"A"—Active	26
"A"—Quiescent	9
"B"—Active	28
"B"—Doubtful activity	5
"C"—Active	14
"B"—Quiescent	1
Total	83
Moderately Advanced:	
"A"—Active	3
"A"—Quiescent	3
"A"—Doubtful activity	8
"B"—Doubtful activity	8
"C"—Active	2
Likely arrest	1
"A"—Arrested	1
"B"—Quiescent	1
Total	27
Minimal:	
"A"—Quiescent	2
"A"—Arrested	1
"A"—Active	1
"A"—Doubtful activity	10
"B"—Doubtful activity	5
"C"—Doubtful activity	2
"C"—Active	2
"B"—Arrested	1
Total	24
2. Nonpulmonary Tuberculosis	1
Bilateral Renal Quiescent	1
3. Nontuberculous	12
Patients admitted for observation nontuberculous	9
Carcinoma of right lung at State Sanatorium only three weeks—fatal	1
Lung abscess	2
	12
4. Childhood type	35
Childhood lesion retrogressive	22
Child contact suspect	2
Child tuberculosis of hip	1
Child contact—no evidence of tuberculosis	2
Child adult type doubtful activity	2
Mediastinal gland	1
Old pleurisy	1
Adenitis active	1
Newly admitted patients x-rayed but not classified	3
	35
Deaths	33
Pleurisy with effusion	6
Tuberculosis—Hip Quiescent	1
Tuberculosis—Hip Arrested	1
Tuberculosis—Spine Active	1
Tuberculosis—Enteritis Active	22
Old pleurisy	6
Psoas abscess	1
Tuberculosis laryngitis	12
Tuberculosis peritonitis	16
Tuberculosis adenitis	8
Ischio-rectal abscesses	6
Discharges:	
Children—14	
Childhood lesions—retrogressive not active	10
Unimproved	1
No evidence of tuberculosis	3
	14
Adults—125	
Arrested	39
Apparently arrested	24
Quiescent	21
Improved	15
No improvement	16
Nontubercular	10
	125
Deaths—Total 33	
Children	1
Adults	32
	33
X-ray—Total 1016	
Number of plates taken of patients	664
Number of plates taken of employees	201
Number of plates taken of out-patients (adult)	87
Number of plates taken of out-patients (children)	64
	1016
Fluoroscoped	1636
Artificial Pneumothorax:	
Total patients taking pneumothorax, May 25, 1933	25
Number patients taking pneumothorax from May 25, 1933, to May 25, 1934	91
Total patients taking pneumothorax on May 25, 1934	61

Total refills given May 25, 1933, to May 25, 1934	1420
Phrenicectomies	9
Lipiodol (Diagnostic)	10
Laboratory:	
Total number sputum tests	4823
Total number urine tests	1859
Wassermann tests	255
Blood counts	360

Medical Staff: In 1929 we had 148 patients and two medical assistants. We are now averaging over 250 patients with a staff alike in number, but greatly reduced salaries. Some difficulty and much annoyance has been occasioned by the engagement of highly recommended irresponsibles, but this has been overcome and we feel that the patients and the profession are again being given good service, the latter in plate readings and diagnosis rendered on films sent in for interpretation. May we suggest that in the latter the age and clinical history of the case should accompany the plates.

The Nursing Staff: While we have been obliged to materially reduce the salaries paid and have almost wholly abandoned the custom of employing undergraduates of two years' training to the number of about one-third of the staff, we have been enabled to replace them with competent registered graduates at a slight increase in salary over that paid the undergraduate, and feel that in nursing also we are excellently staffed at a much reduced salary total.

Within the past few months the morale of San Haven patients has improved wonderfully and this I attribute almost wholly to physician and nurse replacements causing restoration of confidence.

The comforts experienced by the nurses when off duty in the Nurses' Home may largely be attributed to the tactful management of the Mother Supervisor of the Home.

The Children's Building has been operating at capacity and with its day school, presided over by a competent teacher, is yearly becoming more popular with the public in adequately caring for contact children.

The San Piper: A monthly published by the patients for the past year has greatly helped sustain the morale of the convalescing patients. They vie with each other in the production of breezy copy. I'm sure if our members realized its worth to San Haven Patients every one would go down in his pocket for the half dollar that represents a year's subscription, and would further give it a boost in home service club activities. It cannot be self-supporting short of a subscription list of 400. To the tax payer, it is surely worth the money in the benefits experienced by the patients in their literary contributions, and besides each number carries a message of importance to the public aiming at prevention of the spread of tuberculosis.

We have had appeals from the local health and school officials of certain tuberculosis infected communities to go out and Mantoux test the children. One of these came from a Red River Valley County over 200 miles away.

If we are enabled to carry another experienced staff member, we can then manage to go out for a day occasionally to skin-testing clinics and later to x-ray at cost the positive reactors. We did last fall go out to the county seat of a neighboring county and Mantoux test 109 school children, the County Superintendent of Schools having previously recorded the name, age, parent' names and address and personal history of each case by the County Nurse on blanks furnished by us in triplicate, one for the State Health Officer, one for the County Health Officer, and one for San Haven, that a follow up system might be initiated. Of these 109 children, eighteen were positive reactors, and these were brought to San Haven and x-rayed at cost.

Without a reasonable shadow of doubt there are communities in North Dakota where tuberculosis is rife, and where there are some chronic carriers giving little or no outward evidence of infection, but saving the seed that as the years go on will reap a harvest of human grief and waste of public money. Here is where a travelling clinic would in one such community pay the expense of the equipment of such a clinic and the salaries of its personnel.

Physical Improvements During the Year at San Haven

First in order of time: More ready access to the Institution by a 3/8 mile extension of a spur of No. 3 Highway from the west as it passes north skirting our western boundary to reach the Canadian Boundary and the International Peace Garden shortening the distance of our coal haul over the old route from the south by one-eighth mile, a considerable saving in the expense of coal hauling by truck from the depot of an average of from three to four and in winter as high as five cars a week.

Having to convert two of the existing cottages from exercise to infirmary use and with the addition of the new Gift Cottage to the same service, we were obliged to transport meals to the bed-postured occupants from the infirmary kitchen, as these cottages are only equipped with

hot plates, pantries and ice boxes. This necessitated the construction of a tunnel leading from the infirmary basement kitchen to two of the cottages, for the transport of cooked food by steam trucks.

Again the extension of our water works was required for greater fire protection to the infirmary patients, the Nurses' Home, the Children's Building, and certain cottages.

Our reservoir for water storage was insufficient and we were obliged to excavate and cement enclose a reservoir of 70,000 gallons capacity in addition to the one already serving 50,000 gallons.

With the new highway entrance from the west there came a demand for a western entry, motor-parking space and a hill top levelled, stone walled and gravelled; the old one by the power house still serving for the employees.

As there were complaints from the nearby Dunseith citizens and our neighbors that the waste water from our power house and sewage from our septic tanks were polluting the waters of Lake Schatte at the foot of our grounds, the State Engineer's office sent up a staff man to overcome this nuisance, and the result was that a disposal basin was designed toward our south-east boundary with specifications to excavate a basin 175 ft. by 175 ft. by 30 ft. deep to receive by tiled drainage Y-shaped, the product of the above two sources and dispose of them through the gravelled floor of this basin.

Further excavating a hillside to reach under the porch of the old infirmary unit, there was removed an area of earth 100 x 14 x 6 ft. deep for storage room—reached from the infirmary basement.

Also a disposal drying bed beyond the septic tank was created.

Two 12 x 12 x 8 ft. soft water cisterns, cement enclosed, were excavated for the use of cottage patients.

Much landscaping by way of brush removal and beautification of the grounds by tree transplanting, also by the construction of a stone walled-in area adjoining the green house as a nursery for promoting the growth of year old evergreens and other decorative types, for removal later to sightly fronts on the grounds.

In all eleven of these improvements were undertaken as C.W.A. projects and most of them accomplished when the weather was at a sub-zero level. For a time 150 men and about thirty teams were engaged in excavating the disposal basin, the reservoir and the ditches. Hundreds of pounds of dynamite were used on blasting out the frozen earth in the disposal basin.

Not to be overlooked is an eighty feet long, twelve feet wide cement walled vegetable storehouse, cut through a hill ridge adjacent to the back door of the infirmary, from an offshoot of which is built a film vault for the storage of old combustible films. This and some of the other improvements above mentioned were undertaken and accomplished by our own employees.

Recommendations

1. Endorsement by the members of this Association and co-operative support of the program now being forwarded for a new ninety bed infirmary unit and for the necessary power house additions linked up with it.

2. Endorsement and support of a legislative program for creating and equipping a field unit under the direct control of operation by San Haven, the State Health Office, and the Executive Members of the State Board of Administration, the two first mentioned acting in an advisory capacity only.

3. Legislative support in a request for increased personnel of the medical staff at San Haven providing for a Superintendent, a Medical Director and a first and second assistant of whom one of the latter may be a woman. In the formation of this staff, I think it is of the utmost importance that the Superintendent at least and the Medical Director preferably be mid-western men and if possible North Dakotans, enlightened upon the State's needs, and its political geography; familiar with the location of its rural centers and its laws. This too should apply to an organized travelling clinic.

Further, I would recommend that occupational therapy be added to its equipment, when a new unit has been constructed, and when one of the present cottages will thus be relieved of its infirmary patient care and can be used to house its classes. By this means I feel that the convalescing patient can have his self-dependence largely restored so that he will be rehabilitated to go out into the world again with confidence and a will for self-maintenance.

And lastly may I recommend and urge that each actively practicing member of the profession visit San Haven singly or in local society groups, that you may inform yourself of its activities, and that the staff may have the benefit of your constructive criticism and the patients have assurance of your interest in their welfare; also that you may keep informed on the physical improvements, and so inspire your patient when apply-

ing for admittance with the benefits that he will probably obtain from early placing himself under the cure-taking methods.

As a parting word, may I recommend that if and when a new infirmary unit is added caring for a total patient population of 350, the institution will require two more members on the medical staff in addition to the one above referred to and that one of the additional members be an experienced orthopedist, as I have in mind that it will then be found practicable to have the present Administration Building revert to its original tuberculous service, and give harborage to gland, bone, joint, and chest surgical cases, and a new administration building erected facing the highway entrance at the west and in the vicinity of the new public parking space, where information can be furnished and where it will conveniently serve visitors upon entering the grounds.

Respectfully submitted,
CHARLES MACLACHLAN,
Chairman

Secretary Skelsey read the following letter from Dr. Fannie Dunn Quain:

April 30, 1934.

Dr. A. W. Skelsey,
Fargo, North Dakota.
Dear Dr. Skelsey:

Soon after the meeting of the North Dakota Medical Society last year, the Tuberculosis Association received notice that the Society had voted the sum of $105.00 for the work. Three boys were admitted to Camp Grassick for the season as a result of this donation. We wish to report concerning these boys, at this time.

Alvin Wassmann, Golva, North Dakota, aged 14 years, was admitted to camp on July 3, 1933. He weighed 95 pounds, was very white and somewhat stooped in posture. He was discharged at the end of the season weighing 107 pounds; his color and posture were much improved.

The examining physician was Dr. V. G. Morris, Golva, North Dakota. The boy was recommended to Camp Grassick by J. W. Wentland, County Superintendent, Beach, North Dakota.

Ray Vreeland, Hazen, North Dakota, aged 10 years, was admitted to Camp Grassick on July 5, 1933, weighing 64¼ pounds. His tonsils were in bad condition. He had recovered from pneumonia the month previous. He made good gains and was discharged August 8, weighing 71 pounds. The boy was a "Gold Star Camper," also. His honor record shows that he rested well, attended faithfully to his camp duties, and was commended for his politeness.

The examining physician in this case was Dr. J. O. Arnson, Bismarck, North Dakota. The boy was recommended to camp by Mrs. Floyd Nelson, Hazen, North Dakota.

Ray Vreeland's follow-up report gives the following information:

Until the end of March, 1934, Ray had not missed a day of school. He appears stronger and healthier than ever before. His parents run a small restaurant, and he found it hard to take the required rest. However, he went to his sister's home to take his afternoon nap. At night he goes to bed at eight o'clock, as he did at the camp. He has tried to keep up the diet advised at Camp Grassick and has improved his school record, as a result of the regular health habits. His parents and friends are delighted with his improvement.

Clifford Burian, Fryburg, North Dakota, aged 9 years, was admitted to Camp Grassick on June 29, 1933. He weighed 54 pounds and had enlarged tonsils and cervical and inguinal glands. He gained slowly but steadily in weight every week and was discharged August 3, weighing 58½ pounds.

Clifford's honor record shows that he was a "Gold Star Camper," having received a gold star every week for his fine spirit and co-operation.

The examining physician was Dr. J. B. Gumper of Fryburg. The boy was recommended to Camp Grassick by Ann M. Brown, Medora, North Dakota.

The follow-up report of Clifford shows that he has attended school every day, so far this year. His school work has improved, and since he has followed the habits learned at the camp, he has continued to gain in weight. Mrs. Burian says, "We thank you very much for all you have done for Clifford."

The communities to which these children return, hold these children up to the other kiddies in their towns, as examples of the results of right living. Besides the improvement in the health of the three children, paid for by the donation, the educational work for the health of the rest of the children in these communities, is far-reaching.

We hope to open Camp Grassick earlier and run for a longer period this season. It would be a great pleasure to the management of the camp to have any or all of the doctors in the State Medical Society inspect the set-up at Lake Isabell, five miles south of Dawson, at any time during the season.

We take this opportunity to thank the Society for last year's gift.

Yours respectfully,
(Signed) FANNIE DUNN QUAIN, M.D.,
Chairman, Camp Committee,
North Dakota Tuberculosis Association.

Dr. Frank I. Darrow moved that this report and letter be accepted and published in THE JOURNAL-LANCET.

The motion was seconded.

Dr. John Crawford expressed the opinion that it would be to the advantage of the members of the county society to hold at least one meeting each year at San Haven. He also stressed the need of controlling the arrested cases, and thought the Association should go on record as believing that the funds from the sale of Christ-

mas seals should be used to support a mobile clinic unit equipped to make the Mantoux test and roentgenograms, when necessary.

Dr. MacLachlan stated that such a travelling unit would be able to find not only the fibrotic cases that are infecting others, so that they could be brought in and placed where they could be cared for, but also many early cases that could by proper treatment be arrested without such a long residence in the sanatorium, and could also follow up patients who had been discharged but needed further care. He felt that as much money could be raised by the sale of Christmas seals in North Dakota as elsewhere and that if the State Medical Association recommended that this be done the State Tuberculosis Association would be willing to co-operate. The funds would thus be directed to a much better purpose, if used to finance a mobile clinic unit, than when used as they are at present.

Dr. Williams stated that during the past year she has been working with the Anti-Tuberculosis Association and their plan has been that 45 per cent of the fund goes back to the county. She has urged them to use this money in the county for families that have cases of tuberculosis. If they cannot afford to pay their doctor the money is to be used to pay for skin testing, x-ray examination and thorough physical examination.

Dr. MacLachlan expressed the opinion that not many members of the Society knew much about the natural attractiveness of the region around Turtle Mountains, and thought that if they wished to have a camp for these infected children it should be located in such a locality as this, where there would be facilities for whatever examinations were necessary, as well as splendid facilities for outdoor life and lessons in natural history.

This question was further discussed by Drs. Matthaei, Drew, Greene, MacLachlan and McCannel.

Dr. Williamson moved that a committee with Dr. Maysil Williams as Chairman, she to select the other members, go to the Anti-Tuberculosis Association and try to get their co-operation in having the funds received from the sale of Christmas seals diverted to the prevention of tuberculosis, the Committee to report back next year.

The motion was seconded by Dr. Murdock MacGregor and unanimously carried.

Committee on Military Affairs

Dr. L. B. Greene, Chairman, presented the following report and moved its adoption:

The Committee on Military Affairs urges that every member of the Association, holding a Commission in the Medical Officers Reserve Corps, retain it. That all attempts, legislative or otherwise, to do away with the R. O. T. C. Units at the State University and State College, be strenuously combatted.

We approve of the work performed by the C. C. C. during the last year and urge its continuance, believing that, among other benefits, not the least is that of instilling some small amount of military discipline into the youth of our nation enrolled in its ranks.

Respectfully submitted,

Lee B. Greene, *Chairman*
E. P. Quain
W. H. Long

The motion to adopt was seconded by Dr. Williamson and unanimously carried.

Committee on Public Relations

Dr. Frank I. Darrow, Chairman, presented the following report:

Because of the membership of this Committee being so widely separated the Chairman of your Committee has attempted to get some ideas from the members of the Newspaper Fraternity by correspondence. Accompanying this report is a letter from Beatrice Mann which contains some valuable suggestions. The other members failed to respond. Mrs. Mann's letter is as follows:

May 4, 1934.

Dr. Frank Darrow,
Dakota Clinic,
Fargo, N. D.

Dear Doctor Darrow:

I have your recent letter and am pleased to reply to your request for suggestions leading to closer relationship between the medical and newspaper professions.

Undoubtedly many methods would be pertinent and profitable but as you mention medical news dissemination as an objective, I think of one method in particular which should meet the ethical standards of both groups.

Your council might select a member of the society to arrange a periodical news letter or release (either signed or run under a selected head, or both), and suitable for publication in the larger newspapers of the state. The content should be informative, timely, and of special interest to North Dakota readers. A concise article, perhaps not over 700 words, would probably be most read and more acceptable to the newspaper profession as a whole. Also your selected contributor could arrange items of more local interest to be brought to the attention of the newspapers in the proper cities.

It is my opinion that the arrangement I have outlined, properly executed, would meet with universal

acceptance by publishers who are interested in the health and welfare of their communities. I trust that this suggestion may be of some value to you.

Very truly yours,

(Signed) Beatrice Mann.

It is the opinion of your Chairman that this Committee should be continued, as it is a new venture, and it will take time for it to function properly. It is recommended that next year more than one member of the Medical Association be appointed on this Committee, as this will facilitate action with the Press in different parts of the State.

Newspapers are primarily interested in selling news and advertising, and it will take some work to convince them that education of the public on medical matters should be one of their functions. It is recommended that this sort of thing be worked out by next year's Committee, and presented to the Press for criticism and approval.

The question of whether funds from the State Association should be used in any part for this work should be decided and the method of distribution taken up. The question of sickness and death notices should be gone over and appropriate suggestions given. This information is largely gathered now from lay help in hospitals or mortuary establishments.

The policy of the State Association toward group educational advertising by County Societies should be determined. In the opinion of most medical men, news agencies always write up medical subjects in "the wrong way," if at all possible. This is not entirely their fault, and from conversations with newspaper men I feel confident suggestions will receive proper attention, as they are anxious to improve this part of their services.

Your Chairman feels that the Committee on public relations should function as a clearing house for all form of publicity. It is suggested that a complete list of the newspapers of the State be kept on file and that all publicity approved by the Association be given out through this Committee. In this way it can be of valuable assistance to the Society as a whole and the various Committees requiring publicity. It can create relations with broadcasting stations and learn of their available time and facilitate the making of broadcasts appropriate for this kind of publicity.

It is the opinion of the Chairman of this Committee that certain types of this publicity should be paid for, and that better co-operation will thus be possible for the type of information and news that does not bear so directly on the economic side of medicine.

Respectfully submitted,

Frank I. Darrow, M.D.
Chairman.

Dr. McCannel moved that the report be adopted.

The motion was seconded by Dr. MacLachlan and unanimously carried.

Dr. Murdock MacGregor moved that a letter be sent by the Chairman of the Committee and by Secretary Skelsey to Mrs. Beatrice Mann, expressing the appreciation of the Association for her co-operation.

The motion was seconded by Dr. Larson and unanimously carried.

Committee on Care of Early Mental Cases

In the absence of the Chairman, Dr. H. A. Brandes reported that there had been no meeting of this Committee.

New Business

Secretary Skelsey read the following letters and resolutions:

ST. LOUIS MEDICAL SOCIETY

May 12, 1934.

Dr. A. W. Skelsey, Secretary,
North Dakota State Medical Association,
20 Broadway,
Fargo, North Dakota.

Dear Doctor:

For your information I am enclosing a copy of a resolution which was introduced by our editor and delegate, Dr. R. B. H. Gradwohl, at the meeting of the Missouri State Medical Association at St. Joseph, May 8, 1934. This resolution was unanimously passed and I bring it to your attention in the hope that your Association may adopt a similar resolution at its next meeting.

Very truly yours,

John C. Morfit, M.D., President.

Report of Medical Economics Committee

Adopted by House of Delegates Missouri State Medical Association, May 8, 1934.

Whereas, DEFINITE policies are now in operation and in the process of development in various parts of the country with the object of attaining the co-operation of hospitals, clinics, medical colleges and like institutions, in observing the economic and ethical principles enunciated by component local societies in affiliation with the Missouri State Medical Association, and

Whereas, AS A result of these policies by component units of the Missouri State Medical Association, definite "approved lists" of hospitals

clinics, medical colleges, and like institutions are properly being compiled, therefore be it

Resolved, THAT the Missouri State Medical Association memorialize the American Medical Association, and instruct its delegates thereto, to request the American Medical Association to adopt policies by which the American Medical Association shall not approve any institution for any purpose unless and until such institution shall be officially in the approved list of the component medical society or societies in the jurisdiction of which such hospital or institution is located or operates. Any institution failing of approval of the society or societies concerned shall have the right of appeal to and hearing before the proper committee of the American Medical Association.

CHICAGO MEDICAL SOCIETY

May 4, 1934

Dear Doctor:—

By direction of the Council of the Chicago Medical Society, the Cook County Unit of the American Medical Association, I enclose resolution adopted on April 10, 1934.

The Chicago Medical Society believes that concerted action of the state societies through the American Medical Association should be able to modify or entirely eliminate much of the misleading information now being broadcast. If these resolutions meet with your approval, it is suggested that similar resolutions be presented at the meeting of your State Society, and if adopted be forwarded to the Federal Radio Commission at Washington.

In order that I may report back to the Council the action of your State Society, if you do advocate similar resolutions, I will appreciate a copy and statement of the action taken at your annual meeting.

Sincerely yours,

THOMAS P. FOLEY, M.D.
Secretary

Whereas, The health of the citizens of the United States constitutes the greatest asset of the Nation, and the responsibility of conserving the health of the citizens and restoring them to health in times of illness reposes in the medical profession, and

Whereas, This responsibility is very great, as is evidenced by the high educational and professional standards which physicians are required to meet in the various states of the Union before being permitted to diagnose disease and treat the sick, and

Whereas, Satisfactory and safe service of this type can only be rendered after a long and careful study of the causes and symptoms of disease, and that these causes and symptoms can only be determined after an interview with and physical examination of the patient, and

Whereas, No rational or safe treatment can be decided upon and carried out under circumstances other than those above set forth without danger to the life or health of the patient, and

Whereas, For many months past the radio broadcasting companies of the United States have through their various broadcasting stations permitted the exploitation of many drugs, preparations, patent medicines, and so-called cures, to the radio audience of America, and

Whereas, It has been well established that some of the drugs, preparations and patent medicines so exploited are dangerous in the hands of the layman; others are of doubtful value, and in practically all instances their value for the relief of the symptoms and conditions for which recommended have been overstated and are misleading to the public, and

Whereas, The symptoms and conditions for which these drugs, preparations and patent medicines are recommended may be, and frequently are, indications of serious conditions calling for careful study on the part of a well qualified physician in order that a correct diagnosis may be made, and the proper treatment instituted before the disease reaches an advanced stage, and

Whereas, Radio broadcasting is under the control of the Federal Radio Commission, and the radio is being used to broadcast nonsupportable claims and statements regarding a large number of drugs and preparations for the treatment of human ailments:

Therefore, Be It Resolved, That the North Dakota State Medical Society is opposed to the advertising, recommending or in any way exploiting over the radio any preparations, remedies, medicine or appliances for the treatment of human ailments; and that a copy of these resolutions be forwarded to the Federal Radio Commission with a request that in the interest of the health of the citizens of the United States they exercise their authority to discontinue such advertising over the radio,

Be It Further Resolved, That physicians use such influence with their patients and with the public as may be necessary to secure their cooperation in sending protests to the Federal Radio Commission and to broadcasting stations against misleading and unwarranted medical advertising.

AMERICAN MEDICAL ASSOCIATION

May 14, 1934.

Dr. Albert W. Skelsey, Secy.,
North Dakota State Med. Assn.,
20-½ Broadway,
Fargo, North Dakota.

Dear Dr. Skelsey:

The North Dakota State Medical Association meets, I understand, May 28. The North Dakota Legislature meets in January, 1935.

"I wonder if it might not be wise for the North Dakota State Medical Association to take appropriate action with respect to the legislation named below? Possibly the Association will want to sponsor such legislation, either with or without amendment, and to procure its introduction into the Legislature. On the other hand, it may want to oppose such legislation if someone else proposes it. By initiating studies of these matters now the Association will be better prepared in January next.

"The measures referred to are as follows:

"The Proposed Uniform State Narcotic Act. The bill for this act was drafted by the National Conference of Commissioners on Uniform State Laws. It has been approved by the American Bar Association and the American Medical Association. Several states have adopted it already.

"The State Caustic Poison Act. The draft of the bill for this act was prepared in this office, at the instance of a Committee on Caustic Poisons, of the Section on Laryngology of the American Medical Association. This bill has been enacted in a number of States.

"A Medical Lien Act. This bill has not been formally approved by any proper agency of the American Medical Association. It was prepared in this office, however, to satisfy inquires received from a number of state medical associations for information concerning legislation of this character. The extent to which such legislation has been adopted is shown in the accompanying analysis of it.

Copies of all of the three bills referred to above accompany this letter.

Sincerely yours,

WM. C. WOODWARD, M.D.,
Director.

Dr. Williamson moved that the resolution from the Chicago Medical Society regarding radio broadcasting concerning drugs, that the resolution from the Bureau of Legal Medicine and Legislation of the American Medical Association concerning a Uniform State Narcotic Act, and the Medical Lien Act and the State Caustic Poison Act be adopted.

The motion was seconded by Dr. W. C. Fawcett and unanimously carried.

Dr. Charles MacLachlan presented the following resolution:

Be It Resolved, That the House of Delegates of the North Dakota State Medical Association in annual convention assembled appeal through its Secretary to Honorable Justice A. M. Christianson, Administrator of the F.E.R.A., to grant the sums necessary for the construction and equipment at San Haven, North Dakota, of a ninety-bed infirmary unit, and for the increased housing capacity and necessary engine power for serving the same.

CHARLES MACLACHLAN, M.D.

Dr. MacLachlan moved the adoption of this resolution.

The motion was seconded and unanimously carried.

Dr. A. E. Spear moved to adjourn.

The motion was seconded by several and the House of Delegates adjourned at 10:15 p. m., to reconvene at 12:30 p. m., on Monday, May 28.

Second Meeting, Monday, May 28, 1934

The second meeting of the House of Delegates was held at the Hotel Gardner, and was called to order at 12:40 p. m. by the President, Dr. Jesse W. Bowen, Dickinson.

ROLL CALL:

Secretary Skelsey called the roll and reported a quorum present.

President Bowen declared the House duly constituted for the transaction of business.

Appointment of Committee on Nominations

The President appointed as a Committee on Nominations: Drs. A. P. Nachtwey, Dickinson; James P. Aylen, Grafton; John Crawford, New Rockford.

Report of Committee on Formation of Executive Committee

Dr. Charles MacLachlan, Chairman, presented the following resolution:

Be It Resolved, That the North Dakota State Medical Association in annual convention assembled, does hereby delegate to its President the power to name a committee of five (5) of its members, of whom its President, Secretary and three other members, one of whom shall be a member of the House of Delegates, one a member of the Council and one other appointed by

the President, shall constitute this committee. This committee shall be known as the Executive Committee of the State Association, and is hereby empowered as representing the State Association, to act upon all emergency matters affecting its members that cannot in the very nature of the circumstances be allowed to wait for the next annual meeting of this body.

Be It Further Resolved, That the necessary sections in the Constitution and By-Laws of this body be amended to take cognizance of this initiative. Further be it.

Resolved, That the term of office of this Committee shall be and remain in force until the next annual meeting of the State Medical Association, when its report will be rendered to this body for its consideration.

Respectfully submitted,

CHARLES MACLACHLAN,
Chairman
A. P. NACHTWEY
A. R. SORENSON
JOHN CRAWFORD
A. D. MCCANNEL

Dr. MacLachlan moved the adoption of this report.

The motion was seconded by Dr. A. E. Spear and carried.

Report of Committee to Review Dr. Williams' Report

Dr. H. A. Brandes, Chairman, presented the following resolutions:

Your Committee after careful study of resolutions submitted by the Committee on Public Health, recommends to the State Medical Association for their approval the following resolutions:

Whereas, The North Dakota Legislature of 1932 reduced the appropriation for the State Health Department to such a degree that the minimum essentials of a health department cannot be maintained, be it therefore

Resolved, That the North Dakota State Medical Association petition the next Legislature to increase the appropriations to the State Board of Health, sufficient to permit the operation of the basic duties of the State Health Department.

Whereas, There has been and is still in progress a National Child Recovery and Maintenance program which was initiated by the Secretary of Labor, Washington, D. C., October, 1933, be it therefore

Resolved, That the North Dakota State Medical Association lend its co-operation and support to this program.

Whereas, Advisory Health Committees to the County and City Boards of Health are being organized in the Counties and Cities of the State it is desirable that the State Medical Association lend its co-operation and guidance in working out a Public Health program for such counties and cities.

Your Committee recommends that the State Medical Association give its support and co-operation to the program for state-wide immunization for diphtheria and smallpox, and where funds are made available for relief agencies that these funds be used only for the immunization of children of parents who are on relief rolls. The committee approves of the tentative arrangements made by the Committee on Medical Economics whereby physicians participating in work of immunizing children of parents on relief rolls be paid at the rate of $10.00 per day.

The Committee recommends that the resolution of Public Health Committee relating to tuberculosis be referred to the Committee on Tuberculosis for their consideration and recommendation to the State Medical Association.

Respectfully submitted,

H. A. BRANDES,
Chairman
JOHN CRAWFORD
L. B. GREENE
A. E. SPEAR
A. R. SORENSON

Dr. Brandes moved the adoption of this report.

The motion was seconded by Dr. Charles MacLachlan and unanimously carried.

New Business

Dr. P. G. Arzt introduced the question of transportation for the families of employees of the railroads outside of the State, and stated that the present ruling conflicted in some way with the Federal law. He wished to know if the Delegate from the North Dakota State Medical Association to the American Medical Association could be instructed to bring this up at the coming meeting of the A. M. A., requesting interstate transportation.

This question was discussed by Drs. O. T. Benson and G. M. Williamson.

Dr. Arzt moved that the Delegate from the Association be instructed to bring this up at the meeting of the House of Delegates of the American Medical Association at the Cleveland meeting.

The motion was seconded by Dr. Benson and carried.

Dr. H. A. Brandes, referring to the matter of local health advisory committees, urged that every member of the component societies present go home and stress the importance of every general physician co-operating in public health work. He suggested that at one meeting a year of each society the public health officer be asked to take charge of the program.

Selection of Meeting Place

Dr. A. R. Sorenson, on behalf of his local society, invited the Association to hold the next annual meeting in Minot.

Dr. W. W. Wood, on behalf of his local society, repeated his invitation of 1933 to hold a meeting in Jamestown either in 1935 or 1936, whichever the Society might decide.

Dr. W. C. Fawcett moved that the invitation to meet in Minot in 1935 be accepted.

The motion was seconded by several and carried.

Dr. MacGregor moved to adjourn.

The motion was seconded and the House of Delegates adjourned at 1:00 p. m., to reconvene at 12:30 p. m., Tuesday, May 29.

Third Meeting, Tuesday, May 29, 1934

The third meeting of the House of Delegates was held at the Masonic Temple, and was called to order at 12:40 p. m., by the President, Dr. Jesse W. Bowen, Dickinson.

ROLL CALL:

Secretary Skelsey called the roll and reported a quorum present.

President Bowen declared the House duly constituted for the transaction of business.

Report of Committee on Nominations

Dr. A. P. Nachtwey, Chairman, presented the following report:

Your Committee on Nominations beg to submit the following recommendations:

President, C. E. Stackhouse, M.D....Bismarck
President-elect, A. D. McCannel, M.D...Minot
First Vice-president, W. A. Gerrish, M.D.
.....Jamestown
Second Vice-president, E. L. Goss, M.D.
.....Carrington
Secretary, A. W. Skelsey, M.D.....Fargo
Treasurer, W. W. Wood, M.D.....Jamestown
Delegate to A. M. A., year 1935, A. W. Skelsey, M.D.....Fargo

Councilors

Second District, G. F. Drew, M.D..Devils Lake
Seventh District, P. G. Arzt, M.D., Jamestown
Eighth District, L. B. Greene, M.D...Edgeley
Tenth District, A. E. Spear, M.D...Dickinson

State Board of Medical Examiners

Jesse W. Bowen, M.D. .....Dickinson
W. C. Fawcett, M.D. .....Starkweather
John E. Hetherington .....Grand Forks

Respectfully submitted,

A. P. Nachtwey, Chairman
J. P. Aylen
John Crawford

Dr. Nachtwey moved that the rules be suspended and that the Secretary cast a unanimous ballot for these nominees.

The motion was seconded by Dr. N. O. Ramstad and unanimously carried.

Dr. Skelsey reported the ballot cast and the President declared these gentlemen duly elected.

New Business

Dr. A. D. McCannel asked for an expression of opinion regarding the date of the next meeting and the possibility of condensing the scientific program into a day and a half, to permit those attending to leave Minot on afternoon trains without missing any of the program.

This question was discussed by Drs. Murdock MacGregor, G. M. Williamson, J. W. Bowen, N. O. Ramstad, W. C. Fawcett and A. D. McCannel.

Dr. Fawcett moved that the date of the meeting be left to the local committee on arrangements, with a meeting of the House of Delegates and the Council on the afternoon of the day preceding the scientific session, and that the scientific program be condensed into a day and a half for the next annual meeting.

The motion was seconded by Dr. E. M. Watson and unanimously carried.

Dr. A. E. Spear moved to adjourn.

The motion was seconded and the House of Delegates was declared adjourned at 12:50 p. m., *sine die*.

A. W. Skelsey, M.D.,
Secretary.

PROCEEDINGS OF THE COUNCIL
of the
NORTH DAKOTA STATE MEDICAL ASSOCIATION
1934

FIRST MEETING
Sunday, May 27

The first meeting of the Council was held at the Hotel Gardner, Fargo, and was called to order at 10:00 p. m. by the Chairman, Dr. L. B. Greene, Edgeley.

MINUTES

Dr. N. O. Ramstad moved that the minutes as published in the August 15, 1933, issue of THE JOURNAL-LANCET be adopted.

The motion was seconded and unanimously carried.

Appointment of Auditing Committee

The Chairman appointed the following to serve as an Auditing Committee: Drs. G. F. Drew, Chairman, Devils Lake; N. O. Ramstad, Bismarck; E. L. Goss, Carrington.

Dr. Murdock MacGregor moved to adjourn.

The motion was seconded by G. M. Williamson and the Council adjourned at 10:20 p. m., to reconvene on Monday at 1:00 p. m.

SECOND MEETING
Monday, May 28

The second meeting of the Council was called to order at the Hotel Gardner at 1:05 p. m., by the Chairman, Dr. L. B. Greene, Edgeley.

Report of Auditing Committee

Dr. G. F. Drew reported that the Auditing Committee had carefully examined the books of the Treasurer and the Report of the Secretary and found them correct.

Dr. Murdock MacGregor moved that the reports of the Treasurer, Secretary, and the Auditing Committee be accepted.

The motion was seconded by Dr. P. G. Arzt and unanimously carried.

Report of Editorial Committee on Journal-Lancet

Dr. N. O. Ramstad reported verbally that only two members of this Committee were present and they felt that it was unfair to make any report for the Committee, preferring to submit the question to the Council.

Briefly the JOURNAL-LANCET asked for a five year contract, charging for the first year $1.00 per year, for the second $1.50 and for the following three years $2.00 per year. Several members of the Society with whom Dr. Ramstad had talked had expressed opposition to a five year commitment.

This question was informally discussed by Drs. Arzt, Drew, Goss, Wicks, Ramstad, Spear and Williamson.

Dr. Williamson agreed with the other speakers that the JOURNAL-LANCET in the past few years had improved materially, and felt that the management could do better work if they had a permanent arrangement with the medical societies for a certain number of years.

He moved that the Medical Association of North Dakota arrange with the JOURNAL-LANCET for a three year contract, at $1.00 for the first year, $1.50 for the second and $2.00 for the third, with the understanding that if the JOURNAL-LANCET remains satisfactory the Association would be willing to go on for an additional two years.

The motion was seconded by Dr. Murdock MacGregor.

Discussed by Drs. Drew, Williamson, Ramstad, Wicks, and Arzt.

Dr. Williamson's motion was then put to a vote and carried.

Election of Officers

The following officers were elected: Dr. L. B. Greene, Edgeley, Chairman; Dr. George M. Williamson, Grand Forks, Secretary.

As this completed the business before the Council for the forty-seventh annual session, the meeting was declared adjourned at 1:45 p. m., *sine die*.

GEORGE M. WILLIAMSON, M.D.,
Secretary of Council.

PROCEEDINGS
of the
GENERAL MEETING
of the
NORTH DAKOTA STATE MEDICAL ASSOCIATION
1934

FIRST DAY
Monday, May 28—Morning

SCIENTIFIC PROGRAM

The first general meeting was called to order at the Masonic Temple, Fargo, N. D., at 9:20 a. m., by the President, Dr. Jesse W. Bowen, Dickinson.

Gastrointestinal Clinic

Diagnosis and Medical Consideration - - - - - - Dr. A. M. Snell, Rochester, Minn.

X-ray Interpretation - - - - - - - -
- - - Dr. B. R. Kirklin, Rochester, Minn.
Diagnosis and Surgical Consideration - - -
- - - Dr. E. Starr Judd, Rochester, Minn.

Dr. E. M. Hammes, St. Paul, Minn., read a paper entitled, "Consideration of Cerebral Hemorrhage."

President Bowen announced that there would be a meeting of the House of Delegates at the Hotel Gardner at 12:30, and declared the meeting adjourned at 11:50 a. m., to reconvene at 1:30 p. m.

FIRST DAY

Afternoon

The Association reconvened and was called to order at 1:50 p. m. by President-Elect Dr. C. E. Stackhouse, Bismarck.

Dr. Jesse W. Bowen presented his presidential address, and then took the chair.

Dr. George Foster, Fargo, N. D., read a paper entitled, "Bronchoscopy in General Medicine."

Dr. A. M. Snell and Dr. B. R. Kirklin, Rochester, Minn., presented a paper entitled, "Clinical Aspects of Gastric Cancer."

Dr. E. Starr Judd, Rochester, Minn., read a paper entitled, "Surgical Treatment of Cancer of the Stomach."

Dr. Walter L. Bierring, President-Elect of the American Medical Association, Des Moines, Ia., addressed the Association on "Heart Disease."

Dr. V. J. LaRose, Bismarck, N. D., read a paper entitled, "Significance of Genito-Urinary Bleeding."

The meeting was declared adjourned at 5:00 p. m., to reconvene at 9:00 a. m., Tuesday.

ANNUAL BANQUET

The Annual Banquet was held at the Hotel Gardner at 7:00 p. m., with Dr. Frank I. Darrow as toastmaster.

Following the dinner an address was given by Dr. Walter L. Bierring, Des Moines, Iowa.

SECOND DAY

Tuesday, May 29—Morning

The Association reconvened and was called to order at 9:10 a. m., by the President, Dr. Jesse W. Bowen, Dickinson.

Dr. E. F. Robb, Minneapolis, Minn., gave a clinic on Pediatrics.

Discussed by Dr. Ray Morton Balyeat, Oklahoma City, Okla.

Dr. Wallace Cole, St. Paul, Minn., gave a clinic on Fractures.

Dr. Ray Morton Balyeat, Oklahoma City, Okla., addressed the Society on "Allergy."

The Association adjourned at 12:30 p. m., to reconvene at 1:30 p. m.

SECOND DAY

Afternoon

The Association reconvened and was called to order at 2:00 p. m., by the President, Dr. Jesse W. Bowen, Dickinson.

Dr. Bowen introduced the newly-elected President, Dr. C. E. Stackhouse, who took the chair.

Judge H. A. Bronson, Grand Forks, N. D., delivered an address entitled, "Concerning Activities Against Irregular Practitioners."

President Stackhouse requested Dr. Bowen to report the action of the House of Delegates concerning election of officers and the meeting place for 1935.

Dr. Julius O. Arnson, Bismarck, N. D., read a paper entitled, "Cardiac Arrhythmia."

Dr. E. F. Robb, Minneapolis, Minn., read a paper entitled, "Poliomyelitis."

Dr. Wallace Cole, St. Paul, Minn., read a paper entitled, "Arthritis."

President Stackhouse expressed his personal thanks to the essayists who had taken part in the program, particularly to those who had come from outside the state, and also expressed the appreciation of the Association to the Fargo members who had arranged the program and furnished such excellent entertainment during the meeting, and declared the forty-seventh annual session adjourned at 4:15 p. m., *sine die*.

A. W. Skelsey, M. D.,
Secretary.

PRESIDENTIAL ADDRESS

Jesse W. Bowen. M.D., Dickinson, N. D.

Today we hear on every hand the portentous rumblings of vast social, economic and governmental changes. We become fascinated in the attempt to discern, amid all the confusion, trends and tendencies which we interpret as forebodings of harm or good. Much of this phenomena of change we evaluate in terms of how it will affect us as individuals or as groups in society. As members of the medical profession we naturally raise the question, Of what significance are these changes to us? To what extent will the comprehensive program for socialization and control be carried out in the realm of medical practice? As yet there has been no definite direct action. However there is current a vast amount of propaganda and agitation to effect some scheme of state medicine. It is my belief that it is imperative that we study the proposals for re-

form, to determine if possible, the factors which gave rise to their inception, their implications and their potentialities for good or evil. These changes, I believe, involve principles which are basic to the security of our profession. It is imminently necessary for us to be on the alert to ward off any influences which will tend to jeopardize the future status of the science and art of medicine.

The recommendations of the Committee on the Cost of Medical Care are indicative of the policies of the campaign now being waged. These recommendations were, (I quote), "that medicine in small towns center around hospitals as nuclei supervised by super organizations in larger cities" and the further recommendation, "that the costs of medical care be placed on a group payment basis, through the use of insurance, through the use of taxation, or through the use of both of these methods." It will be noted from these recommendations that the report did not confine itself to the subject ostensibly under discussion, but developed into propaganda for state medicine. This report has been well publicised, and has had far reaching effects in undermining the confidence of the public in the medical profession.

An interesting side light on the matter of group insurance mentioned in the report is afforded by the presence in our own state of the various mutual benefit societies. These sporadic organizations offering wholesale insurance at minimum cost, were once hailed with enthusiasm which since has waned into skepticism. Hospitals and doctors have become somewhat poignantly aware of the fact that the majority of the concerns have presumed to institute a code of fee charges which became farcical in an attempt at standardization. The difficulties inherent in the situation close at hand gives us an indication of the dangers of extending the scope of the plan.

Until the publication of this report and its incumbent propaganda, the majority of our profession had viewed schemes of reform similar to those mentioned with considerable complacency as being dreams of isolated reactionary groups. We have now, however, been brought to a certain extent to realize that the stage is set for the putting into effect of these policies. A receptive mind set has been insidiously inculcated into the public. The governmental state of flux and tendencies toward paternalism has made the proposals far more liable to acceptance than at any time previous.

As a result of these factors the physician is beginning to evince some real concern regarding his conversion into a servant of healing under the orders of a bureaucratic state. He is beginning to look with distrust upon a program which will tend ultimately to destroy his personal status.

In a general consideration of the schemes advocated, I believe we can discern certain fairly definite factors which will make the proposals impractical and destructive in nature.

First, the intrusion of a third party, the government, will interfere with the confidential relationships between doctor and patient. There is no profession where these personal relationships are of more supreme importance. They cannot be lightly brushed aside without serious consequences.

Secondly, the scheme must involve some form of sickness insurance which will undermine manliness and lead to cultivation of malingering. There is no need to unduly promote the possibilities for hypochondria.

Consideration must also be given the fact that under this system the really sick will not secure the treatment desired. Treatment will be standardized and administered to human beings as though they were so many robots with difficulties which need to be fixed.

Incidentally, state medicine will prove itself costly in administration, as is certainly borne out by experience in Germany.

The harmful possibilities of the proposed measures to society and to our profession have a very definite implication to the individual practitioner. It means that we as individuals and our organizations must use every conceivable means to combat the current tendency. The prestige of our profession is at stake and must be thrown in the balance against the forces of dissolution.

In any consideration of the problem there is one factor which must assume paramount importance. And that is, that we take heed of the accusations hurled against us, consider the extent of their justifiability, and then take all necessary and possible measures to set our own house in order.

It is essential, first, that we continue to raise the standards of our profession. Steps must be taken to prevent certain unprofessional practices which have grown more prevalent in

the past four years. This can only be done by making it possible for each doctor to maintain a decent standard of living, to secure necessary equipment and to enable him to continue post-graduate work. In turn it is evident that this can only be accomplished by insuring each physician an adequate field of practice. Modern conditions have altered considerably the conception of an adequate practice. Extensive hospitalization, good roads, concentration of population and modern equipment tend to extend the number of patients whom the physician can care for. The ratio of physicians to the population has decreased from 1 to 692 inhabitants in 1906 to one to every 786 inhabitants in 1931. The situation today, however, indicates that not yet have we sufficiently restricted the number of practitioners to counteract modern developments which have narrowed the field.

The assurance of a decent standard of living will substantially eliminate prevalent unethical practices. In addition there must be maintained a rigid adherence to the code of ethics and also to the spirit of the Hippocratic code. So long as we allow sharp practices to exist we place ourselves liable to criticism. Unless we, by concerted action, set our own house in order we will also be liable to rigid restrictions and regimentation by governmental authority.

As individuals we are comparatively powerless, but as a part of a national organization, the American Medical Association, we wield tremendous power. In view of the critical situation which we must face, it is imperative that we support with unswerving fidelity the national organization. By this means and by this alone can we be saved from the forces of dissolution. There can be no dissension in the ranks; as individuals and state organizations we must regiment ourselves into the organization of a powerful frontal attack. Our very life blood is at stake and hope only remains in the expectation that every man will do his duty.

DISTRICT AND COUNTY ROSTER

CASS COUNTY MEDICAL SOCIETY

PRESIDENT

MacGregor, M. .....Fargo

SECRETARY-TREASURER

Kilbourne, B. K.....Fargo

Aylen, J. P. .....Grafton
Baillie, W. F.....Fargo
Boerth, E. H.....Buffalo
Bray, R. B.....Fargo
Brown, W. G. .....Fargo
Burton, P. H.....Fargo
Crim, E. B. .....Fargo
Darrow, Frank I.....Fargo
Dillon, J. G. .....Fargo
Evans, L. J.....New York City
Elofson, C. E. .....Fargo
Fjelde, J. H. .....Fargo
Floew, A. T. .....Fargo
Fortin, H. J. .....Fargo
Foster, G. C. .....Fargo
Haugen, H.....Fargo
Haugrud, E. M. .....Fargo
Haynes, G. H.....Lisbon
Heimark, A. J.....Fargo
Hofmann, P. E. .....Fargo
Hotchkiss, Wm.....Fargo
Huntley, H. B.....Leonard
Ivers, G. U. .....Fargo
James, J. B.....Page
Jelstrup, C. .....Petersburg
Joistad, Arthur H.....Fargo
Kilbourne, B. K.....Fargo
Larson, G. A.....Fargo
Lewis, T. H.....Fargo
Limburg, A. M.....Fargo
Long, W. H. .....Fargo
MacGregor, M.....Fargo
Miller, H. W.....Casselton
Morris, A. C.....Fargo
Nichols, A. A. .....Fargo
Nichols, W. C.....Fargo
Oftedal, Axel .....Fargo
Oftedal, Sverre.....Fargo
Patterson, T. C.....Lisbon
Pray, R. E. .....Fargo
Richter, E. H.....Hunter
Rindlaub, E.....Pasadena, Calif.
Rostel, Hugo.....Fargo
Rothnem, T. P.....Fargo
Skelsey, A. W.....Fargo
Stolinsky, A.....Sheldon
Swanson, J. C.....Fargo
Watson, E. M. .....Fargo
Weible, R. E.....Fargo
Winn, W. R. .....Fargo

DEVILS LAKE DISTRICT MEDICAL SOCIETY

PRESIDENT

Fawcett, J. C. .....Devils Lake

SECRETARY-TREASURER

Drew, G. F.....Devils Lake

Arneson, A. O. .....McVille
Barnes, N. J. .....Rolla
Beek, R. H.....Lakota
Call, A. M.....Rugby
Drew, G. F.....Devils Lake
Engesather, J. A. D.....Brocket
Fawcett, J. C.....Devils Lake
Fawcett, W. C.....Starkweather
Graham, J. D.....Devils Lake
Greengard, M. .....Cando
Horsman, A. T.....Devils Lake
Laugeson, L. M...San Diego, Cal.
Lees, H. D. .....Philadelphia
MacDonald, J. A. .....Cando
McGurren, C. J....Devils Lake
McIntosh, G. J.....Devils Lake
McLean, Neil.....Devils Lake
Mattson, R. H.....McVille
Nicholson, E. G.....Lawton
Olafson, K. .....Cando
Sedlacek, B. B.....Fort Totten
Sihler, W. F.....Devils Lake
Smith, C.....Devils Lake
Stickelberger, J.....Oberon
Toomey, G. W. .....Devils Lake
Verrett, B. D. .....Rolla
Vigeland, J. G.....Brinsmade
Widmeyer, J. P.....Rolla

GRAND FORKS DISTRICT MEDICAL SOCIETY

PRESIDENT
Ruud, M. B. .....Grand Forks

SECRETARY
Lohrbauer, L. T...Grand Forks

TREASURER
Miller, J. P. .....Grand Forks

Algers, L. J. .....Grand Forks
Bentzen, Olaf .....Grand Forks
Benwell, H. D.....Grand Forks
Campbell, R. D.....Grand Forks
Countryman, G. L. .....Grafton
Countryman, J. E.....Grafton
Deason, F. W.....Grafton
Eggers, Aug.....Grand Forks
Engstad, J. E.....Grand Forks
Field, A. B.....Forest River
Flaten, A. N.....Edinburg
French, H. E.....Grand Forks
Glaspel, C. J.....Grafton
Glaspel, G. W.....Grafton
Goehl, R. O. .....Grand Forks
*Grassick, James....Grand Forks
Halldorson, M. B., Winnipeg, Can.
Hardy, N. A.....Minto
Haugen, C. O. .....University
Haagenson, E. C. ...Grand Forks
Healy, H. H.....Grand Forks
Hetherington, J. E...Grand Forks
Hofto, J. M.....Grand Forks
Irvine, V. S.....Park River
Landry, L. H.....Walhalla
Law, H. W. F.....Grand Forks
Leigh, R. E.....Grand Forks
Liebeler, W. A.....Grand Forks
Lohrbauer, L. T...Grand Forks
Lommen, C. E. .....Fordville
McQueen, W. W.....Langdon
Mahon, R. M.....Grand Forks
Miller, J. P.....Grand Forks
Moore, J. H.....Grand Forks
Mulder, J. L.....Cavalier
Mulligan, T.....Grand Forks
Mulligan, V. A. .....Langdon
Muus, H. O.....Grand Forks
O'Keefe, H. .....Grand Forks
Panek, A. F.....Milton
Peake, M. F.....Grand Forks
Quale, V. S. .....Grand Forks
Rand, C. C. .....Crystal
Ruud, H. O. .....Grand Forks
Ruud, M. B. .....Grand Forks
Rystad, O. H.....Grand Forks
Stratte, J. J. .....Grand Forks
Stromberg, G. E.....Langdon
Thompson, A. Y.....Larimore
Thorgrimsen, G. G..Grand Forks
Tompkins, C. R.....Grafton
Vance, R. W.....Northwood
Wagar, W. D.....Michigan
Waldren, H. W., Jr.....Drayton
Waldren, H. M., Sr. .....Drayton
Weed, F. E.....Park River
Williamson, G. M...Grand Forks
Witherstine, W. H..Grand Forks
Woutat, H. G.....Grand Forks
Woutat, P. H. .....Grand Forks
Youngs, N. A. .....Grand Forks

KOTANA MEDICAL SOCIETY

PRESIDENT
Jones, C. S. .....Williston

SECRETARY-TREASURER
AbPlanalp, Ira. S.....Williston

AbPlanalp,Ira S.....Williston
Craven, J. P.....Williston
Dochterman, L. B.....Williston
Hoeper, P. G. E.....Williston
Johnson, P. O. C...Watford City
Jones, C. S.....Williston
Owenson, H. A. .....Arnegard
Skovholt, H. T.....Williston
Wright, W. A.....Williston

NORTHWEST DISTRICT MEDICAL SOCIETY

PRESIDENT
Cameron, A. L. .....Minot

SECRETARY-TREASURER
Pence, J. R.....Minot

Bascom, K. F.....Minot
Batherwick, W. E.....Van Hook
Breslich, P. J. .....Minot
Cameron, A. L.....Minot
Carr, A. .....Minot
Carr, A. M.....Minot
Craise, O. S.....Towner
Dalager, N. O.....Anamoose
Devine, J. L.....Minot
Durnin, G. A. .....Bottineau
Erenfeld, H. M. .....Minot
Fardy, M. J.....Minot
Flath, M. G.....Stanley
Frogner, G. S. .....Parshall
Garrison, M. W.....Minot
Gates, Russell.....Minot
Goodman, Robert..Powers Lake
Grangaard, H. O.....Ryder
Green, E. E. .....Westhope
Halliday, D. J. .....Kenmare
Halverson, H. L.....Minot
Hanson, G. C.....Minot
Haraldson, O.....Minot
Hayhurst, J. O.....Rolette
Hillis, S. J.....Berthold
Hurd, F. D.....Tolley
Jensen, A. F.....Rugby
Johns, S. M.....Velva
Johnson, J. A.....Bottineau
Kermott, L. H.....Minot
Knapp, H. G.....Minot
Kolb, F. K.....Granville
Leedahl, O. S.....Stanley
Lyman, F. V.....Velva
McCannel, A. D.....Minot
Moffat, George.....Crosby
Nelson, L. F.....Bottineau
Newlove, J. T.....Minot
Pence, J. R.....Minot
Pence, R. W.....Minot
Pierce, A. E.....Minot
Ransom, E. M.....Minot
Ray, R. H.....Garrison
Robertson, C. W. .....Minot
Rollefson, C. J.....Crosby
Rollie, C. O.....Drake
Rowe, P. H.....Minot
Seiffert, G. S. .....Minot
Smith, J. A. .....Noonan
Sorenson, A. R.....Minot
Steeves, E. O.....Rugby
Timm, J. F.....Makoti
Wheelon, F. E.....Minot
Yeomans, T. N.....Minot

SHEYENNE VALLEY MEDICAL SOCIETY

PRESIDENT
Campbell, Wm. .....Valley City

SECRETARY-TREASURER
Moore, Will. H.....Valley City

Almklov, L.....Cooperstown
Brown, Fred.....Valley City
Campbell, W.....Valley City
Macdonald, A. C.....Valley City
Macdonald, A. W....Valley City
Meredith, C. J.....Valley City
Moore, Will H.....Valley City
Platou, C. A.....Valley City
Pray, E. A.....Valley City
VanHouten, J.....Valley City
Wanner, W. B.....Wimbledon
Westley, M. D.....Cooperstown
Wicks, Fred L.....Valley City
Zimmerman, S. A....Valley City

SIXTH DISTRICT MEDICAL SOCIETY

PRESIDENT

Roan, M. W. .....Bismarck

SECRETARY-TREASURER

Larson, L. W.....Bismarck

Arnson, J. O.....Bismarck
Baer, DeWitt.....Steele
Benson, O. T.....Glen Ullin
Berg, H. M.....Bismarck
Bodenstab, W. H.....Bismarck
Brandes, H. A.....Bismarck
Brandt, A. M.....Bismarck
Buckingham, T. W. ....Bismarck
Bunting, F. E.....Mandan
Constans, G. M.....Bismarck
Diven, W. L.....Bismarck
Eastman, L. G.....Hazen
Fisher, A. M.....Bismarck
Fredricks, L. H.....Bismarck
Freise, P. W. .....Bismarck
Gaebe, O. C.....New Salem
Gerdes, Maude M. .....Zeeland
Gordon, W. L.....Washburn
Griebenow, F. F.....Bismarck
Hallenberg, R. W. .....Bismarck
Hamilton, E. E.....New Leipzig
Heinzroth, Geo. .....Turtle Lake
Henderson, R. W.....Bismarck
Hetzler, A. E. .....Mandan
LaRose, V. J.....Bismarck
Larson, E. J. .....Underwood
Larson, L. W.....Bismarck
Leavitt, R. H.....Carson
Lipp, G. R.....Bismarck
Monteith, George.....Hazelton
Moyer, L. B. .....Elgin
Nelson, J. M.....Hebron
Nickerson, B. S.....Mandan
Owens, P. L.....Bismarck
Pierce, W. B.....Bismarck
Quain, E. P.....Bismarck
Quain, F. D.....Bismarck
Ramstad, N. O.....Bismarck
Rassmussen, F. P.....Beulah
Rice, P. F.....Solen
Roan, M. W.....Bismarck
Rogne, W. G. .....McClusky
Schoregge, C. W.....Bismarck
Smith, C. C.....Mandan
Smith, L. G.....Mandan
Spielman, G. H.....Mandan
Stackhouse, C. E.....Bismarck
Strauss, F. B.....Bismarck
Thompson, R. C.....Wilton
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Hanson, Geo. C.....Minot
Haraldson, O.....Minot
Hardy, N. A.....Minto
Haugen, C. O. .....University
Haugen, H.....Fargo
Haugrud, E. M. .....Fargo

Hayhurst, J. O.....Rolette
Haynes, G. H.....Lisbon
Healy, H. H.....Grand Forks
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Hotchkiss, W. M.....Fargo
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Hurd, F. D.....Tolley
Irvine, Vincent S....Park River
Ivers, G. U. .....Fargo
James, J. B.....Page
Jelstrup, Christian.....Petersburg
Jensen, August F.....Rugby
Johns, Stephen M.....Velva
Johnson, J. A.....Bottineau
Johnson, P. O. C...Watford City
Joistad, A. H.....Fargo
Jones, Carlos S.....Williston
Kermott, Louis H.....Minot
Kilbourne, B. K.....Fargo
Kjelland, A. A.....Hatton
Klein, A. L. .....McHenry
Knapp, Henry G.....Minot
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Kolb, F. K.....Granville
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Lang, A. A. J.....Jamestown
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Larson, G. A.....Fargo
Larson, L. W.....Bismarck
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Moyer, L. B. .....Elgin
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Nelson, L. F.....Bottineau
Newlove, J. T.....Minot
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Nicholson, E. G.....Lawton
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Patterson, S.....Rhame
Patterson, T. C.....Lisbon
Peake, M. F.....Grand Forks
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Pence, R. W.....Minot
Perkins, G. A.....Dickinson
Pierce, A. E.....Minot
Pierce, W. B..... ....Bismarck
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Pray, E. A.....Valley City
Pray, R. E. .....Fargo
Quain, E. P.....Bismarck
Quain, F. D.....Bismarck
Quale, V. S.....Grand Forks
Radl, R. B.....Minneapolis
Ramstad, N. O.....Bismarck
Rand, C. C. .....Crystal
Ransom, E. M.....Minot
Rasmussen, F. P. .....Beulah
Ray, R. H.....Garrison
Ribble, George.....LaMoure
Rice, P. F. .....Solen
Richter, E. H.....Hunter
Rindlaub, E.....Pasadena, Calif.
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Rogne, W. G. .....McClusky
Rollefson, C. J.....Crosby
Rollie, C. O.....Drake
Rostel, Hugo.....Fargo
Rothnem, T. P.....Fargo
Rowe, P. H.....Minot
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Ruud, M. B.....Grand Forks
Rystad, O. H.....Grand Forks
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Schumacher, N. W....Hettinger
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Sciffert, G. S. .....Minot
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Skelsey, A. W.....Fargo
Skovholt, H. T.....Williston
Smith, C. C.....Mandan
Smith, C.....Devils Lake
Smith, J. A.....Noonan
Smith, LeRoy G.....Mandan
Smith, O. M.....Killdeer
Sorenson, A. R.....Minot
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Hematuria

V. J. LaRose, M.D.*
Bismarck, N. D.

IN DISCUSSING hematuria or blood in the urine I refer to conditions where blood is present in the voided urine in sufficient quantity to attract the attention of the individual. Cases in which red blood cells are found in the urine on microscopic examination only, while of equal importance, will not be considered.

The sudden appearance of blood in the urine, referred to as gross hematuria, is usually significant of some grave disorder in the urogenital tract and too much emphasis cannot be placed on the fact that early and prompt diagnosis in all cases is of paramount importance.

The onset of gross hematuria may be symptomless or it may be associated with mild or severe symptoms which may or may not point to urogenital origin. It may often occur abruptly, during apparently good health, in an individual previously free of symptoms referable to the urinary tract. The fact that many of these attacks may last but a few hours or days and then cease spontaneously should not defer a thorough examination as they tend to recur at some later period. This may be a matter of days, weeks or months and in some, several years may elapse between the initial attack and the succeeding one. It is unfortunate that many grave lesions of the kidney, ureter or bladder manifest themselves in their early stages by painless hematuria of sudden onset, because many individuals, upon observing that they are passing bloody urine unaccompanied by pain or distress, are inclined to treat the matter too lightly and instead of seeking medical advice, they dose themselves with some of the many advertised bladder or kidney remedies to which they give all credit when the hematuria spontaneously ceases. Recurrent attacks are often treated with these "magic" remedies until failing health, distress or pain compels the patient to seek the advice of his physician only to learn that an obstructed or diseased kidney has been destroyed, a benign lesion has become malignant or an early malignancy has become incurable. Our records also show a number of instances where even the physician has prescribed for the patient without attempting to determine the source of the bleeding. Such practice should be severely criticized.

When seeing a patient complaining of blood in the urine, first be sure that hematuria actually exists. Guard against urine mixed with blood from outside the urinary tract, such as menstrual blood, blood from bleeding hemorrhoids, blood from a condition of menorrhagia, bearing in mind, also, that all red color in urine is not necessarily due to blood. We should exclude by microscopic examination, hemoglobinuria and pseudohematuria due to the ingestion of drugs.

Gross hematuria may be associated with affections involving any portion of the urinary tract. In some instances pathology adjacent to the genito-urinary tract will account for blood in the urine. Hematuria may also be encountered in certain of the blood dyscrasias, notably hemophilia, purpura, scurvy and certain erythemas. Lesions peculiar to the kidney, such as hypernephroma, cystic conditions, malformations, displacements and other conditions affecting the circulation of the papillae all account for a certain percentage of renal hemorrhage. Lesions which may affect any part of the urinary tract, such as infection, neoplasms—benign or malignant, calculi, stricture, obstruction and trauma are all capable of causing gross hematuria.

The existence of hematuria being positively established, we should at once endeavor to ascertain its cause. It should be an absolute rule that every case of hematuria, believed to be of vesical or renal origin, must be subjected to immediate X-ray and cystoscopic examination. Cystoscopy should be performed while the patient is bleeding, as many hematurias cease suddenly and where there are no other manifestations, diagnosis is impossible. (I can recall several occasions where I have postponed examination until the following day only to find, much to my chagrin, a normal looking bladder with clear urine coming from each kidney.) In the absence of bleeding, an investigation of both kidneys may be necessary. Even in the early stages, growths in the renal parenchyma have a tendency to bulge into the renal pelvis. They may be shown by pyelograms in which deformities of the calices or irregularities in pelvic filling are suggestive of renal tumor or pelvic growths. Great care should be exercised in interpreting pyelograms when making a diagnosis of gross hematuria of renal origin. Clots in the pelvis or upper ureter may produce filling defects similar to tumors of the parenchyma or pelvis. If there is any doubt

*Read at the annual meeting of the North Dakota State Medical Association, Fargo, May 28-29, 1934.

about the diagnosis, a retrograde or an intravenous pyelogram should be made at a later date after all bleeding has ceased.

Certain other signs assisting in the diagnosis are often present in conjunction with hematuria. In early tuberculosis of the kidney, there are present certain mild vesical symptoms, such as day and night frequency, which do not respond to ordinary treatment for cystitis. In more advanced cases, there are polyuria, pyuria, frequency, tenesmus, and a history of more or less remote cystitis. In renal calculus, hematuria may occur abruptly without any previous attack of pain; some kidney stones induce absolutely no pain (silent stone). In other instances, however, pain is a prominent feature. Renal hematuria of calculous origin is often (but not always) brought on by fatigue, walking, horseback riding, long auto journies, etc. In malignancy of the kidney the only symptom may be hematuria which may occur in brief, profuse attacks over a period of several years. Eventually, however, it will appear in conjunction with pain or distress, palpable tumor and some degree of cachexia.

Another relatively frequent cause is hematuric nephritis, with or without pain. This form of nephritis is sometimes associated with only trifling manifestations and the diagnosis is made chiefly by ureteral catheterization; hemorrhage is often bilateral, function impaired, and casts observed.

Painless hematuria often presents one of the most confusing problems in diagnosis. When no cause can be found to account for the bleeding, it has been customary, in the past, to refer to these conditions as cases of essential hematuria. This is a term which has been much criticized within the past few years as being merely a confession of inability to find the cause of the bleeding. More careful and painstaking investigators within the past few years have demonstrated that many of the so-called essential hematurias, or to use a better term, unexplained hematurias, are due to spongy varicose changes in the tips of one or more papillae in the kidney, shown microscopically to be small nevi or angiomata.

Francis H. Redewill in a paper on Renal Sympathectomy read before the Western Branch Society of the American Urological Association in August, 1933 refers to a paper by Muschat and Alexander Randall. He states, "These authors have apparently cleared up the etiology of so-called essential hematuria. They consider the influence of the vaso constrictor fibers in the sympathetics supplying the papillae as causing undue tonic contraction of the smooth muscle at the base of the papillae. This tonic contraction retards the venous flow from the papillae tips, producing venous engorgement and bleeding." Redewill states, "Sympathectomy corrects this condition."

Certain blood dyscrasias due to infections or toxemias often are accompanied by periods of sudden painless hematuria. In cases in which purpura is considered a possible cause of hematuria, careful examination of the blood is indicated. Particular attention should be directed to the blood platelet count, which frequently falls from a normal of 250,000 to below 150,000 or 140,000, the other elements remaining within normal limits.

In suspected hemophilia, estimation of the bleeding time together with a family history of prolonged bleeding in males may serve to make a correct diagnosis.

Certain poisons cause hematuria, such as cantharides, phosphorus, phenol, bichloride of mercury, and some dyes used in industry. Urotropin, so often used in genito-urinary infections, commonly causes hematuria when given in large doses. A careful history obtained from a patient may clear up the diagnosis in many obscure cases.

False or pseudo-hematuria is a condition where urine is colored red by different drugs, such as antipyrine, cascara, senna, rhubarb, and phenolsuphonephthalein. Hemoglobin in the urine may be confused with hematuria. These conditions should all be ruled out by microscopic examination.

A study was made of 110 consecutive cases in which the presenting complaint was blood in the urine, with or without other accompanying symptoms. In this series there were 79 males and 31 females. The youngest male was seven years of age and the oldest seventy-nine. The youngest female was one year; the oldest sixty-three.

The final diagnosis arranged by decades follows:

MALES

1 to 10	Acute nephritis	2
	External trauma	1
10 to 20	Acute cystitis	1
	External trauma	2
	Tuberculosis kidney	1
	Ureteral calculus	2
20 to 30	Acute cystitis	1
	Acute nephritis	1
	External trauma	1
	Pyelocystitis	1
	Tuberculosis kidney	1
	Unexplained hematuria	4
	Ureteral calculus	1
30 to 40	Acute nephritis	1
	External trauma	1
	Malignant papilloma bladder	2
	Pyelocystitis	1
	Renal calculus	2
	Unexplained hematuria	1
	Ureteral calculus	1

40 to 50	Acute nephritis	1
	Benign papilloma bladder	1
	Hypernephroma	2
	Malignant papilloma bladder	2
	Renal calculus	4
	Unexplained hematuria	2
50 to 60	Benign papilloma bladder	3
	Carcinoma bladder	1
	Hypernephroma	2
	Malignant papilloma bladder	2
60 to 70	Adenoma prostate	4
	Benign papilloma bladder	1
	Carcinoma bladder	2
	Carcinoma kidney	1
	Carcinoma prostate	1
	Hypernephroma	3
	Malignant papilloma bladder	4
	Prostatic calculi	1
	Tumor kidney—indeterminate	1
	Ureteral calculus	1
	Vesical calculus	2
70 to 80	Acute nephritis	1
	Adenoma prostate	3
	Carcinoma prostate	1
	Malignant papilloma bladder	4
	Unexplained hematuria	1

Note that in the first three decades, in males, we have acute nephritis, tuberculosis, acute cystitis, and calculi, with the unexplained hematurias predominating in the third decade. With the fourth and fifth decades tumor formation and malignancy begin to appear—benign and malignant papillomata of the bladder, carcinoma of the kidney and hypernephroma. Adenoma and carcinoma of the prostate predominate in the next two decades. From seventy to eighty years of age, ten cases of hematuria showed that four were malignant papillomata of the bladder, one was carcinoma of the prostate, three were due to benign adenoma of the prostate, and one was acute nephritis.

FEMALES

1 to 10	Acute nephritis	1
	External trauma	1
10 to 20	Tuberculosis kidney	1
20 to 30	External trauma	1
	Pyelocystitis	4
	Renal calculus	1
	Unexplained hematuria	2
	Ureteral calculus	3
30 to 40	Acute nephritis	1
	Acute pyelitis	1
	Benign papilloma bladder	1
	Chronic pyelitis	1
	Ulcer bladder	1
40 to 50	Acute cystitis	1
	Chronic pyelitis	1
	Hematuria—urotropin	1
	Renal calculus	2
	Unexplained hematuria	1
	Ureteral calculus	1
50 to 60	Acute cystitis	1
	Polycystic kidney	1
	Pyelocystitis	1
	Renal calculus	1
60 to 70	Malignant papilloma bladder	1

In the females the causes of hematuria were urinary calculi, tuberculosis, acute nephritis, cystitis, pyelitis, trauma and only one malignancy.

Twenty-seven patients in the series presented themselves for examination because of bloody urine with *no other complaint*. The final diagnosis in this series was:

1. Acute nephritis	1
2. Hypernephroma	5
3. Carcinoma kidney	1
4. Tumor kidney—indeterminate	1
5. Unexplained hematuria	6
6. Papilloma bladder, benign	3
7. Papilloma bladder, malignant	7
8. Adenoma prostate	3

Of the above symptomless cases of recurrent bleeding, one patient gave a history of hematuria two or three times each year, for a period of twelve years. No cause could be found to account for the bleeding, thus compelling a diagnosis of "essential hematuria," or unexplained hematuria. Others gave similar histories extending over periods from a few weeks to ten years. In one a blood dyscrasia was suspected, owing to some deficiency of the blood platelet count.

Seven cases of malignant papilloma of the bladder gave histories of symptomless bleeding for periods varying from one month to three years.

Three cases of benign papilloma gave histories of intermittent bleeding extending over periods from one month to one year.

Five hypernephromas gave histories of hematuria of one month, six months, eight months, four years and seven years.

The patient with the indeterminate kidney tumor left before the examination was completed. A tentative diagnosis of hypernephroma was made.

The majority of the symptomless cases of long standing had taken proprietary drug preparations. A few were prescribed for by physicians, who, with their patients, were lulled into a sense of false security when the bleeding ceased temporarily, only to repeat the procrastinating procedure at the next attack.

Eighty-three patients presented various symptoms from mild backache to various forms of dysuria, all accompanied by gross hematuria.

The final diagnosis of the entire series was:

1. Pyelocystitis	7
2. Chronic pyelitis	2
3. Acute pyelitis	1
4. Acute nephritis	8
5. Polycystic kidney	1
6. Renal calculi	10
7. Hypernephroma	7
8. Carcinoma kidney	1
9. Tumor kidney—indeterminate	1
10. Tuberculosis kidney	3
11. Hematuria—urotropin	1
12. Hematuria unexplained	11
13. Ureteral calculi	9
14. Acute cystitis	4
15. Ulcer bladder	1
16. Vesical calculi	2
17. Papilloma bladder, benign	6
18. Papilloma bladder, malignant	15
19. Carcinoma bladder	3
20. Adenoma prostate	7
21. Carcinoma prostate	2
22. Prostatic calculi	1
23. External trauma	7

(*Continued on Page 530*)

The
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MINNEAPOLIS, MINN., AUGUST 15, 1934

NORTH DAKOTA STATE MEDICAL ASSOCIATION

The 1934 session of the North Dakota State Medical Association was held in Fargo, May 27, 28, and 29th. All conditions were indicative of a small non-enthusiastic attendance. Repeated crop failures throughout the state, in addition to the long national depression, local political strife and the nation-wide trend toward state medicine, have brought real financial distress and mental discontent to many of our members.

In spite of this, there was a normal registration on three of the hottest, dirtiest, windiest days that have attacked this drought stricken community.

The scientific meetings were well and enthusiastically attended, including the afternoon of the last day, which I am sure, broke all records for the number of members present at a closing session.

The business meetings boasted 100 per cent attendance at each house of delegates assembly, and were featured by complete, thoughtful and brisk discussion of our problems. The high light was the report of the Medical Economics Committee which revealed a large amount of hard work, resulting in benefits to a large proportion of our membership.

All in all, the session, in spite of adverse conditions, was most successful, and a great deal of credit is due the Fargo medical men who were most congenial hosts.

C. E. S.

EARLIER DIPHTHERIA IMMUNIZATION

According to Minnesota statistics compiled by Dr. E. S. Platou, the percentage of deaths from diphtheria in the school ages has materially declined since 1915, while little or no change has been evidenced for the infant and pre-school child during a corresponding period. Apparently the organized effort in schools of immunization, Schick-testing and detection of carriers by culture is proving its worth.

This might have been anticipated by physicians when they introduced and supervised this work in schools; but its success now serves to point out the neglect of pre-school prevention work and that in an emphatic manner. If, during the past 18 years, the total number of deaths in children under four years of age has remained the same, whereas the percentage of school children dying from diphtheria has been reduced during the same period from around 30% to 8%, then the inference is clearly apparent that the individual physician is derelict in his duty. The same methods of prevention are available for both classes. Immunization should be accomplished before school years. A share of what is now termed "state medicine" could thus be retained as private practice if the family physician would but be alert to his opportunity and exert himself to give advice and promptings, and, what is more important, many lives saved.

A. E. H.

THE NEAR-RELIEF LOAD IN MEDICAL PRACTICE

From a practical standpoint there are but two classes of people with whom physicians have to deal: those who can pay and those who can not. In normal times by far the larger proportion is among those who are at least potentially able to pay their bills and these constitute the backbone of private medical practice. The poor are a small and well-defined body whose needs are supplied by the regular channels of medical relief which are maintained in all well organized communities. The picture changes markedly in times like the present. The proportion of the definitely poor, made up of those who must have relief of all types through public sources, is greatly increased while the numbers of those who are in a position to take care of themselves in every way are much reduced. Furthermore, in between these two main divisions, we find another which is also quite sizeable in numbers. This is what has been termed the near-relief class and it is made up of those who are very near the relief lines but are able to keep up the struggle, for the time being at least, to furnish themselves with the bare necessities of life and no more. It is manifest that when people in this category encounter unexpected stress in the shape of illness or accident they are able to do nothing, either in the way of paying private physicians or private hospital bills. They constitute one of the greatest problems of the present emergency and it is around this class that most of the fancy schemes of economists and socialogists have been woven, in the hope of furnishing a solution for the economic ills which their situation and existence have engendered.

So far the problem has not been adequately met. Those whose straits are sufficiently acute can qualify for admission to governmental institutions or secure outpatient care; if not, they either secure the services of private physicians and help to swell the already heavy burden of unpaid charge accounts with which every physician's books are crowded, or the services are rendered gratuitously without expectation of payment or else, and we are inclined to believe that this often happens, they get along as best they can without making any effort to secure any professional service at all. The same thing is true of the private hospitals. Most of them are carrying a large number of accounts on which they may never realize anything and many of these may have been incurred in a perfectly honest way through the limited resources of patients becoming exhausted long before the need of unexpectedly prolonged hospitalization has ended.

And so, as has been noted, we are confronted with all kinds of plans for the relief of this awkward and distressing situation. We have suggestions of various types of health and hospital insurance and plans for the enlargement of the scope of our tax-supported institutions. We have the elaborate findings of commissions which have spent years in building up structures of statistical data and we have the rather negative attitude of our largest medical organization in its efforts to protect the private practitioner from encroachments on his traditional rights by berating the other fellow without offering a concrete remedy. All this is very bewildering and disconcerting, for when all is said and done, the medical profession today is in the most serious plight in its history, largely due to the fact that this near-relief class which we have described was once the producer of its bread and butter.

Of course, the American Medical Association is the logical body to sift out the chaff from all the pabulum that has been offered and present a workable plan for the relief of a sorely beset profession and an equally distraught public. Will it do so? We doubt it. Momentarily aroused from its lethargy by the prick of the lance of the insolent College of Surgeons it cerebrated long enough to produce its Ten Commandments, but its Moses in the Wilderness will not lead his chosen people anywhere until he spends less time trying to prove that the British Medical Association and its members are dissatisfied with the rope that Lloyd George threw them, which is not true, and more in a constructive analysis of existing and proposed methods for ameliorating our distressed condition. With the organization and means it commands it does seem that our national association might get somewhere in this matter. For years it has had the united support of its entire membership, gathered from the cream and energy of the profession and even now, with dissatisfaction brewing and manifest hither and yon it only seems to rouse its massive head long enough to bark out a few platitudes and then sink back in the sleek satisfaction of a long and honorable record of suspended animation.

One of these days America will produce its own Lloyd George. To socialize medicine will afford someone the most magnificent political opportunity that the dumbest paranoid in Washington could covet and will he grab it? We with our few little cohorts will be swept aside and someone not of our breed and color will hand us the rules and regulations and we'll just have to

take it. Perhaps it will be something suited to our needs and we will get along with it fairly well, like our British brethren do with the National Health Insurance. Perhaps not. Anyway it will not be our baby but we shall be forced to adopt it, just the same. It will be just too bad.

G. C.

NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. C. E. McReynolds, Strasburg, N. D., is now located at Big Fork, Mont.

Dr. Charles E. Howard, Cogswell, N. D., passed away last month at the age of 45 years.

Dr. A. L. Jones, who has been in active practice at Corsica, is now located at Gregory, S. D.

Dr. A. N. Rowe, Brookings, S. D., has moved to Newport, Wash., where he will continue in general practice.

Dr. O. S. Randal, a Minneapolis physician has accepted a position on the staff of the Clinic at Watertown, S. D.

Dr. George E. Routh died at St. Paul last month after an illness of many years at the advanced age of 87 years.

Dr. D. V. Boardman, formerly in practice at St. Cloud, has moved to Ada, Minn., where he will continue general practice.

The Minnesota State Board of Medical Examiners have refused to renew the license of one Mr. James Chmel, Minneapolis.

Dr. V. D. Fergusson, a graduate of Northwestern University, has become associated with his brother in general practice at Kulm, N. D.

Dr. R. F. Millett, of the Mayo Clinic, has moved to Glasgow, Mont., where he will be associated with Drs. Smith, Veitch and Terry of that city.

Dr. G. W. Moore, who has been in active practice for nearly a half century at Hopkins, Minn., was tendered a birthday party by the citizens of that city.

Dr. H. H. James, Butte, Mont., had the misfortune to be thrown from his horse while out calling on one of his patients, with the result of a broken nose and other injuries.

Dr. Reuben Nomland, a former Grand Forks resident, has been elected to membership in the American Dermatological association. Dr. Nomland was graduated from the Rush Medical College in 1923.

Dr. Robert W. Hallenberg, Bismarck, died recently from the results of injuries received in an automobile accident. Dr. Hallenberg was a graduate of the Chicago University, and was very popular among his many friends in the profession.

Dr. C. D. Whipple, one of the pioneer physicians of Minneapolis, passed away last month after an illness of six months, at the age of 71 years. Dr. Whipple was a Minnesota University graduate, but had studied in many of the European cities.

Dr. Myron M. Weaver, associate professor of health and physical education for men and physician in the college health service, Carleton College, Northfield, Minn., has resigned to accept a position in the medical service department of Eli Lilly & Co., Indianapolis, Ind.

The Northern Minnesota Medical Association will hold a two-day session at Brainerd on September 10 and 11. A fine program has been arranged for each day and evening, which should bring out a very large attendance. Write the secretary, Dr. O. O. Larsen, Detroit Lakes, for programs.

Dr. J. A. Meyers, Minneapolis, presented a course of six lectures on diseases of the chest before the group enrolled in the graduate medical course at the University of Washington and Seattle. He also spoke before other organizations, such as the Washington State Tuberculosis Association, the King County Tuberculosis League, and the Northwest Conference on High School and College Hygiene.

At the annual meeting of the Minnesota State Medical auxiliary Mrs. Martin Nordland, Minneapolis was elected president; Mrs. J. F. Elias, Duluth, president-elect; Mrs. Ernest Hammes, St. Paul, first vice-president; Mrs. A. C. Baker, Fergus Falls, second vice-president; Mrs. A. H. Sanford, Rochester, third vice-president; Mrs. Bert Karse, Ortonville, secretary; Mrs. F. J. Norman, Crookston, treasurer, and Mrs. Neil Dungay, Northfield, auditor.

The year 1934 has proved an eventful one in the life of Dr. Thomas Cruickshank, Vermillion, S. D. May 25, the doctor completed his 25th year of service to the University of South Dakota, and recently he completed 35 years of practice in Vermillion. The dean of Clay county practicing physicians is known in almost every town and village in the state and hundreds throughout Clay county have had occasion to come into contact with him, professionally or as close friends.

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters). William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota is the speaker. The program for the month of August will be as follows: August 15, "Infantile Paralysis"; August 22, "Unseen Enemies of Children's Health"; August 29, "How Radium Acts."

Dr. H. E. Robertson, Pathologist, Mayo Clinic, gave a series of six lectures as a part of the graduate course at the University of Washington. His subjects were: "Diseases of the Stomach and Duodenum"; "Tumors and Associated Lesions of the Colon"; "Disorders of the Liver"; "Brain Tumors"; "Diseases of the Lungs"; "Pathologic Conditions of the Urinary Tract." This graduate course was begun twenty years ago and has been given each year except two years while the War was in progress. During the week of intensive work, various phases of medicine and surgery are presented. Two hundred and seventeen physicians from various parts of the state of Washington, Idaho, and Oregon were enrolled this year.

Hematuria

(Continued from Page 526)

Patients with hematuria accompanied by other symptoms of more or less severity report, as a rule, earlier for diagnosis and relief. Thus, the potentially malignant case accompanied by pain or discomfort is often seen early enough to cure conditions that otherwise might become hopelessly malignant. The majority of cases in the series in which symptoms accompanied hematuria sought medical advice in periods varying from one day to six months from the onset of the first attack. A few patients who had very little discomfort waited longer periods and among these, five malignancies were found.

The predominance of malignant cases in this series with histories of first symptoms noted for months and even years serves to emphasize the importance of early diagnosis, the futility of expectant treatment, and the difficulty in bringing before the patient, and in some instances physicians, the fact that such procrastination can only result in high and needless mortality.

Conclusions

Hematurias of sudden painless onset, which persists for a short time and as suddenly cease, are in many cases treated far too lightly, both by the physician and by the patient.

Delay in diagnosis may allow a benign condition, easily curable, to become malignant and hopeless.

Every case of terminal and total hematuria should be subjected to a complete X-ray and cystoscopic examination.

Examination made during the period of bleeding will do much to simplify the diagnosis.

Minute inquiry as to history of personal or family blood dyscrasias is of great importance in painless types of hematuria.

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LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS, JULY 14, 1934

BY EXAMINATION

(June)

Name	School of Graduation	Address
Adkins, Galen Horatio	U. of Minn., M.B., 1934	305 Walnut Ave. S. E., Minneapolis, Minn.
Barton, John Currer	U. of Minn., M.B., 1934	Milw. Co. Gen. Hosp., Wauwatosa, Wis.
Bate, Leonard Coleman	U. of Minn., M.B., 1933, M.D., 1934	974 Manvel St., St. Paul, Minn.
Beek, Harvey Ogden	U. of Minn., M.B., 1933, M.D., 1934	900 Goodrich Ave., St. Paul, Minn.
Bowers, Warner Fremont	U. of Nebr., M.D., 1932	1321 Franklin Ave. S. E., Minneapolis, Minn.
Brust, John Calvin M.	Syracuse U., M.D., 1929	Mayo Clinic, Rochester, Minn.
Canfield, Bruce H.	U. of Minn., M.B., 1933	Miller Hospital, St. Paul, Minn.
Clifford, George William	U. of Minn., M.B., 1932, M.D., 1933	Osakis, Minn.
Coddon, Walter David	U. of Minn., M.B., 1934	992 Laurel Ave., St. Paul, Minn.
Curtis, Rauen Archibald	U. of Minn., M.B., 1933, M.D., 1934	Osseo, Minn.
Dahlquist, Ralph Morris	U. of Minn., M.B., 1934	Hackensack Hosp., Hackensack, N. J.
Flynn, John Edward, Jr.	U. of Minn., M.B., 1934	1092 Ashland Ave., St. Paul, Minn.
Greenberg, Harold Armand	U. of Minn., M.B., 1932, M.D., 1933	266 E. 9th St., St. Paul, Minn.
Holt, Geo. Waltermann	U. of Pa., M.D., 1933	Mpls. Gen. Hosp., Minneapolis, Minn.
Jacobs, Douglas Lien	U. of Minn., M.B., 1934	Wayne Co. Gen. Hosp., Eloise, Mich.
Laymon, Carl Warren	U. of Minn., M.B., 1930, M.D., 1931	University Hosp., Minneapolis, Minn.
Leclercq, George Theo. A.	U. of Minn., M.B., 1933	Mpls. Gen. Hosp., Minneapolis, Minn.
Levant, Arthur Buchman	U. of Minn., M.B., 1934	University Hosp., Minneapolis, Minn.
Lind, Carl John, Jr.	U. of Minn., M.B., 1933, M.D., 1934	3104 45th Ave. S., Minneapolis, Minn.
Lund, Carl John Theo.	U. of Minn., M.B., 1932, M.D., 1933	Underwood, Minn.
Merritt, Wallace Alfred	U. of Minn., M.B., 1932, M.D., 1933	126 E. Williams St., Albert Lea, Minn.
Monson, Leonard Jerome	U. of Minn., M.B., 1932	Hendricks, Minn.
Roberts, Stanley Warner	U. of Nebr., M.B., 1933	2922 N. Emerson, Minneapolis, Minn.
Rumball, John Marcus	U. of Minn., M.B., 1934	Rochester Gen. Hosp., Rochester, N. Y.
Sandt, Karl Eugene	U. of Minn., M.B., 1934	Detroit Receiving Hospital, Detroit, Mich.
Sarnecki, Marchislaw Maurice	Northwestern U., M.B., 1933, M.D., 1934	957 Arcade St., St. Paul, Minn.
Stein, Sam Irving	U. of Minn., M.B. and M.D., 1934	1911 Summit Ave., St. Paul, Minn.
Straus, Maurice L.	U. of Minn., M.B., 1934	St. Cloud Hosp., St. Cloud, Minn.
Trytten, Edwin Gerhardt	Rush Med. Col., M.D., 1934	Albert Lea, Minn.
Virnig, Mark Phillip	U. of Minn., M.B., 1933	New Richland, Minn.
Wallace, Marc J.	U. of Minn., M.B., 1934	St. Mary's Hosp., Passaic, N. J.
Williams, Alvin Beurlen	U. of Minn., M.B., 1934	Santa Clara Co. Hosp., San Jose, Cal.
Zintek, Arthur Raymond	Marquette U., M.D., 1934	1234 S. 29th St., Milwaukee, Wis.

BY RECIPROCITY

Haugen, Clifford Olgar	Rush Med. Col., M.D., 1930	University Stat., Grand Forks, N. D.

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Catlin, Theodore John	U. of Minn., M.B., 1932, M.D., 1933	Buffalo, Minn.
Shellman, McClelland	U. of Minn., M.B., 1933, M.D., 1934	Hibbing, Minn.

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The JOURNAL LANCET

Minneapolis, Minnesota
September 1, 1934

New Series
Vol. LIV, No. 17

A Clinic on Cancer of the Nose and Throat*

Lawrence R. Boies, M.D.
Minneapolis

TUMORS of the nose and throat arise in four general locations: (1) the nasal space and sinuses, (2) the nasopharynx, (3) the tonsils and pharynx, and (4) the larynx. Certain anatomical and functional characteristics of these areas determine to some extent the type of tumor, its manifestations, the course of its development, and also the method of treatment and the prognosis. The cases presented this morning will be confined chiefly to the malignant growths.

Case 1. Carcinoma (squamous cell, grade 3) of a Nasal Fossa

This gentleman was referred to us at the age of 66 because of left sided nasal obstruction. Three years previously, he had consulted his physician because of the same symptoms. At that time, "a growth was removed" and he was without symptoms for a couple of years. The obstruction returned, however, complicated by nosebleeds from this side.

At the time of admission, a greyish-red proliferating mass was noted in the roof of the left nasal fossa about 1.5 cm. from the nasal orifice and reaching down to the anterior tip of the middle turbinate. The lesion was about 2 cm. in length. There was a foul purulent secretion from this side of the nose. A biopsy revealed a squamous cell carcinoma, grade 3.

*Presented at a medical short course for general practitioners at the University Medical School, March 26, 1934. From the Department of Otolaryngology and the Cancer Institute of the University of Minnesota Medical School.

In May 1932, almost two years ago, the growth was implanted with seeds of radium emanation (8.8 millicuries: 1162 millicurie hours). There was a rapid disappearance of the tumor tissue and to date the patient has been clinically well. A small fibrous scar can be noted at the site of treatment.

Case 2. Carcinoma (squamous cell, grade 4) of an Antrum

This patient was 48 years of age when the right side of his face began to swell and pain but it was not tender to palpation. He consulted a physician and was given "lamp treatments" and also had some teeth pulled. The drainage from the dental wound subsided but there was still some fullness of this side of his face, which he did not think was of any significance. Apparently, this fullness persisted for the next two years until the right side of his palate became swollen. He then received some more "lamp treatments" and improved again, but by the end of another year the swelling of the right cheek and palate was so marked that the matter of malignant growth was considered. On admission here, it was noted that the tumor tissue had actually broken through the palate and that his right cheek was involved in a firm swelling. A biopsy indicated a squamous cell carcinoma, garde 4.

This case was treated in April 1931. The external carotid artery on the side involved was ligated, and then the portion of the hard palate

forming the floor of the antrum was removed with surgical diathermy. Tumor tissue had broken through the lateral nasal wall and into the ethmoid area. All of the necrotic tissue and apparent tumor growth was curretted out and the margins of the cavity coagulated with the diathermy current. Radium element in tubes was placed to give him 3,500 milligram hours of radiation. A course of deep roentgen therapy was administrated during the convalesence.

Today, the patient is free from any sign of malignant disease. (Figure 1.) He wears a special dental plate which covers the operative defect in his palate. He is perfectly comfortable.



FIGURE 1

Carcinoma of an antrum (squamous cell, grade 4) three years after treatment with coagulation and radiation. Exposure made through the palate; a dental plate covers the defect.

This case brings up the question of whether his very first symptoms were due to a sinusitis on an infection basis or were actual manifestations of the malignant change which apparently originated in the lining of the maxillary sinus. Previous to his first experience of swelling and pain, he apparently had never been bothered with nasal symptoms. The fact that he apparently received some benefit from the lamp treatments points toward the probability of infection. Did this first infection then play any part in the development of his malignant condition, if the early symptoms were entirely due to the infection? These are matters of speculation. Chronic sinusitis could reasonably supply the irritating factor and probably often does in the initial malignant change in the sinus lining, but whether it actually does is difficult to prove in any given case.

The important lesson in this case is that one must *suspect* malignant disease, particularly in persons of cancer age, in any discomfort localized to the nasal space or accessory sinuses, and *especially* with the symptoms of:

(1) Catarrh (usually unilateral), increasing obstruction, discharge, ulceration, and epistaxis.

(2) Pain.

(3) Swelling.

Case 3. Carcinoma (squamous cell, grade 4) of an Antrum

This case of a carcinoma also originating in a maxillary sinus is shown because the treatment was carried out from a different approach than in the case just presented. This woman was 49 years of age when she began to experience right sided *nasal obstruction*, accompanied by *discharge*. These symptoms persisted for about five months after which time additional symptoms of *pain* and *swelling* began in her right cheek. About two months later, she visited Dr. Valentine of Tracy who in his examination noted a bulging in the right canine fossa under the upper lip, biopsied the tissue and established a diagnosis of a squamous cell carcinoma, grade 4.

When she was referred to us for treatment, there was considerable trophic change in the skin of the right cheek to the extent that with an increase in swelling, it seemed probable that the tumor tissue would break through. It had already broken through the front wall of the maxillary sinus.

This patient was operated on in April 1932. The approach was through the anterior surface of the cheek with a slightly curved incision made with surgical diathermy. A large amount of tumor tissue was curetted from the antrum. After removal of all the apparent tumor tissue, the lateral nasal wall on the involved side had been removed and there was a large opening through the canine fossa under the upper lip. The margins of the cavity were cauterized. Four capsules, each containing 25 milligrams of radium element, were placed to give 2,400 milligram hours of radiation. A course of deep roentgen therapy was administered during the convalescent period.

This particular approach was used in this case because the tumor had broken through anteriorly and the palate seemed to be intact. She has worn a dressing over the defect in her cheek but had returned at this time for a plastic closure (Figure 2A).

Note: An additional photograph is included to show the patient one week after this closure



FIGURE 2A



FIGURE 2B

Carcinoma of an antrum (squamous cell, grade 4) treated through an anterior approach because the tumor had broken through the front wall of the antrum and involved the soft tissues of the cheek. "A" shows the patient two years after this treatment, and "B" a week after plastic closure of the opening in her cheek. The cavity can still be observed through an opening under the lip.

was accomplished by Dr. N. Logan Leven. (Figure 2B).

Case 4. Chondroma of the Septum

This case is malignant only in the sense that a gradual local increase in the extent of the tumor tissue would cause interference with vital function. The patient, age 49, had experienced recurrent attacks of "sinus trouble" over a period of about one year. These attacks could be relieved by treatment from his physician. However, gradual obstruction occurred on the right side and the doctor noted that there was almost complete blockage of the right side of the nose by a hard swelling which seemed part of the posterior portion of the septum. He was referred to us in August 1933. The examination at that time revealed a marked blockage of the right nasal fossa by a rather hard projection from about the mid portion of the septum. This extended into the ethmoid space. A broad spur of tissue extended from the left side of the septum posteriorly to produce partial obstruction to nasal respiration. An X-ray study indicated the extension of the tumor through the lateral nasal wall on the right (Figure 3A). A biopsy showed that the tumor was a chondroma. Surgical removal of the growth was advised; this was declined and the patient returned to his home.



FIGURE 3A



FIGURE 3B

Reproduction of an x-ray view of a chondroma of the septum. The extent of the tumor on the right side through the lateral nasal wall into the antrum can be noted. "A" represents the appearance on first examination; treatment was refused at this time. "B" represents a similar x-ray view about three months later after complication with an infection. Surgical treatment was carried out after the acute symptoms had subsided.

He was seen again about three months later because of a severe headache, the characteristics of which indicated a sphenopalatine ganglion neuralgia. Another X-ray examination at this time indicated a marked sinusitis (Figure 3B). Relief of the headache was obtained by rest in bed and persistent shrinkage of the right nasal fossa with cocaine. The membrane over the sphenopalatine foramen could not be reached directly through the nose because of the obstruction.

When the acute symptoms had subsided, the right maxillary sinus was entered through the canine fossa. This approach gave easy access to the tumor mass. In its extension, the tumor had practically destroyed the right lateral nasal wall through pressure necrosis. A ring curette was used to "whittle" away the main portion of the tumor, which involved the posterior half of the septum. Free nasal respiration was possible on this side after most of the tumor had been removed. Several days later, a submucous resection was performed and additional cartilaginous tissue was removed from the left side to establish free nasal respiration in this side. As the nasal space was cared for in the succeeding days, bits of necrotic tissue came away. On several occasions, the nasal fossae were cocainized and the necrotic margins of the operative space curetted. A portion of the tumor protruding from the superior margin of the septum was not thoroughly accessible. To care for this, an external approach was used to remove the right ethmoidal labyrinth and the remainder of the tumor tissue. Today, the patient is free of symptoms except for a moderate amount of crusting in his nose. If any tumor tissue remains, it is under control.

This case is of interest chiefly because of its rarity. The tumor probably originated in a cartilaginous rest in the ethmoid plate as there was no indication that it came from the quadrangular cartilage. The conservative method of handling this tumor accomplished an adequate removal without any marked discomfort to the patient and without any impairment of his appearance.

Case 5. Fibroma of the Nasopharynx

The next case is also one which is only potentially malignant. This boy came to us at the age of 14 years. His chief complaint was one of obstruction to breathing through his nose and of swallowing; in the latter instance, the obstruction was indicated to be in the back part of the oral cavity. The cause of his difficulty was readily apparent on a direct view of his pharynx. A

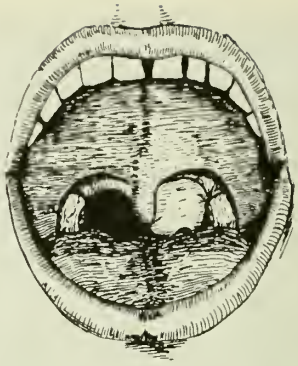


FIGURE 4A

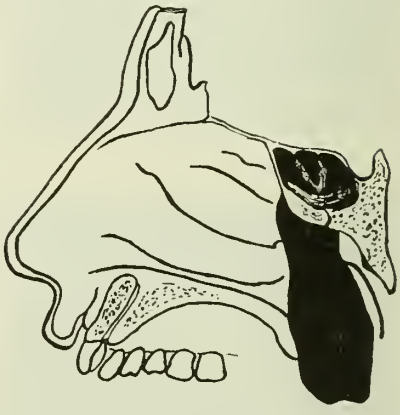


FIGURE 4B

A sketch of the relative position and size of a fibroma of the nasopharynx; "A," view through the oral cavity, "B," relation to the spheno-ethmoidal space.

greyish-white tumor mass could be seen hanging down behind the soft palate on the left and displacing the uvula and soft palate forward. Its lower limit reached to the level of the lingual tonsil. The mass was hard. It was apparently attached by pedicle high in the nasopharynx to the region of the base of the sphenoid. Figure 4 indicates the relative position and size of the tumor as viewed through the oral cavity, and its position in relation to the base of the sphenoid and the choanae. A profuse purulent discharge was present and an X-ray study revealed a bilateral pansinusitis.

The past history as obtained from the patient indicated that he had been concerned with left sided nasal obstruction for the previous one and one-half years. The obstruction had been progressive with the gradual development of a sense of mass in the pharynx. He had been under the care of a physician in another city who had implanted two half millicurie radon seeds in the tumor. These probably made no impression upon it.

A biopsy confirmed the clinical diagnosis of fibroma. The treatment of choice in these cases

is removal with surgical diathermy. Radium has been used with good results but requires more prolonged care. In this case both were used. The danger in surgical removal is due to hemorrhage. The blood vessels in the tumor mass are devoid of a contractile coat, and in the cases where the growth has been twisted off at the attachment of the pedicle, the incidence of fatal hemorrhage has been high.

The boy was operated in November 1932. About three-fourths of the tumor mass could be safely removed with the use of surgical diathermy. The exposure was adequate when the palate was retracted with the patient in a Trendelenburg position. Further removal of the remaining stump of attachment, which seemed to be in the left spheno-ethmoidal area and at the base of the sphenoid, was postponed on account of rather free bleeding. The nasal respiration was markedly improved following this operation. About four months later, the remains of the tumor attachment were coagulated and some seeds of radium emanation implanted into the site of origin of the growth. Several days later, a slough came away and a severe hemorrhage followed. This necessitated a post-nasal pack and transfusion. Today, there is no trace of the tumor except for a healed scar at the site of its attachment.

These tumors are very unusual. They arise from fibrous tissue in a variety of sites in the nasopharynx or adjoining structures; they may be true fibromas or they may be fibroangiomas or fibromyxomas. The tumor is usually first detected about the age of puberty. They are more common in males and when full growth of the patient is attained at about twenty-five years, the tumor undergoes regressive changes and may disappear entirely.

Case 6. Lymphoepithelioma of the Nasopharynx

Malignant tumors of the nasopharynx tend to be highly malignant. I wish to outline for you a typical case. A girl of 19 years was referred to us recently with the following history: About one year previous, she had experienced pain in her left ear and enlargement of a lymph node on the left side of her neck just below the angle of the jaw. A tonsillectomy was performed but the enlarged node persisted and she noted hearing loss in the left ear. About six months after the first symptoms, she was referred to a tuberculosis sanitorium but no tuberculosis was found. Then a swelling appeared anterior to the left ear. A mastoidectomy was performed in August of 1933, nine months after the appearance of the first symptoms. She failed to improve and was admitted here on November 25, 1933. At that time, she seemed to be in a great deal of pain and rather stuporous. There was marked trismus present making the examination of the oral cavity and the pharynx unsatisfactory. She complained of severe pain over the left side of the face, the temporal and parietal areas and around the ear. There was a marked cervical adenopathy on the left side. There was a moderate exopthalmos

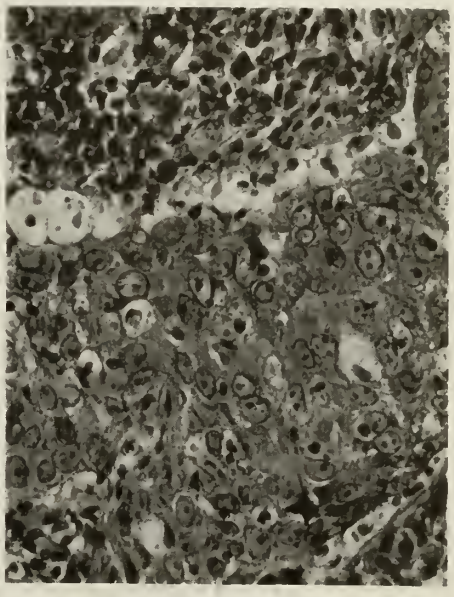


FIGURE 5A

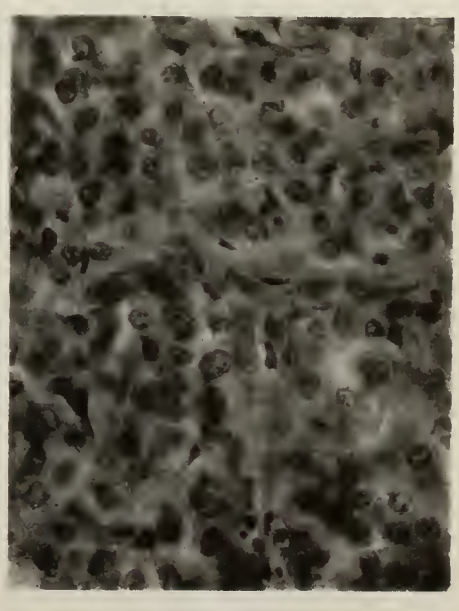


FIGURE 5B

Photomicrograph of a section of a lymphoepithelioma, "A." Compare with "B" which represents a squamous cell carcinoma, grade 4, of the nasopharynx.

of the left eye together with paralysis of the third, fourth, and sixth cranial nerves. A biopsy taken from a cervical node revealed a lymphoepithelioma.

A lymphoepithelioma is a highly malignant radiosensitive tumor which arises in the lymphoepithelial structures of the fauces, base of tongue or the nasopharynx. The characteristic cell stains poorly and the nucleus is large and pale and contains only a few shreds of chromatin. The cytoplasm is clear and abundant. The appearance of the structure suggests endothelial origin. The cells in their growth may become isolated and free within the lymphoid stroma or on the other hand may grow in irregular cords and sometimes form solid masses. The cells do not form spicules of keratin or have any of the characteristics of squamous epithelium. Figure 5A represents a photomicrograph of a section from a lymphoepithelioma; a section from a squamous cell carcinoma, grade 4, is included for comparison (Figure 5B).

The nasopharyngoscope was used to examine the nasopharynx and it revealed a proliferating tumor mass filling the left half of the nasopharyngeal space. It seemed probable that it had its origin in the left fossa of Rosenmuller. (Figure 6).

Deep X-ray therapy was started at once. This resulted in a marked improvement of the patient's condition. Her pain disappeared, she recovered from her stupor, was able to open her mouth, the exopthalmos receded, and the ocular paralyses improved. The prognosis in this case is poor, for obvious reasons.



FIGURE 6A



FIGURE 6B

"A," case of lymphoepithelioma originating in the nasopharynx with metastases to the neck and extension into the orbit on the involved side. The patient was stuporous and in considerable pain when admitted. "B," the patient after x-ray therapy which caused a remarkable regression of the tumor mass and relief of symptoms.

This case teaches an important lesson. In all cases of obscure symptoms about the face and neck, it is important to study the nose and pharynx. No examination is ever complete without a careful use of the mirror; a glance in the nose with a nasal speculum and a brief inspection of the oral cavity is never sufficient. The base of the tongue, the valleculae, piriform sinuses, the eustachian orifices, the choanae, and the fossae of Rosenmuller must all be scrutinized.

Malignant tumors of the nasopharynx are capable of producing a wide variety of symptoms and signs. *The early symptoms are obscure.* One should suspect the nasopharynx in:

(1) Nasal obstruction and bleeding.

(2) Fullness in the ear, tinnitus, and increasing deafness (particularly when unilateral).

(3) Glandular swelling of doubtful etiology in the neck.

(4) Pain localized over the cheek, the mastoid area, the eye, or the frontal and temporal regions. It may be constant or recurrent.

(5) Eye symptoms of diplopia, ptosis, choked disc, etc.

These symptoms are due to the close relationship of the growth to the eustachian tube, the second, third, and fourth cranial nerves, the second and third divisions of the fifth nerve, the gasserian ganglion, the sella tursica, and the jugular foramen (9, 10, 11 and 12 cranial nerves).

Case 7. Lymphoepithelioma Originating in a Lingual Tonsil

This man is 71 years of age. He came to us because of a large swelling of the left side of his neck. He claimed that he had first noticed it about three months previously, and that it had gradually increased in size without causing him any particular discomfort. The swelling was firm, non-tender, and about six centimeters in diameter and considerably raised above the surface. It covered the left submaxillary region and extended back below the angle of the jaw. In searching for a possible related condition within the oral cavity, pharynx, or nasopharynx, a small lesion was discovered in the left lingual tonsil. The growth was elevated about three millimeters above the surrounding tissue but was not ulcerated. In color it was slightly darker than the normal lingual tissue. The surface was smooth but irregular. The biopsy revealed a lymphoepithelioma.

Deep X-ray therapy was administered. The effect on the metastatic tissue in the neck was remarkable; the tumor literally melted away. The origin in the lingual tonsil was implanted with seven seeds of radium emanation totalling 11.9 millicuries to give 1,570 millicurie hours. At the end of eight weeks, there was still some palpable tumefaction in area of metastases in the neck. This was also implanted with radium emanation seeds totalling eight millicuries to give 1,056 millicurie hours. The patient suffered no particular discomfort aside from the reaction to this therapy. Figure 7 represents a sketch of the relative position and size of the original tumor and of the secondary manifestations.

It is now about nine months since this treatment was completed. The patient has been seen at monthly intervals. On this visit, he states that there seems to be some swelling again in the left side of his neck. The original treatment did not cause a complete disappearance of all of the

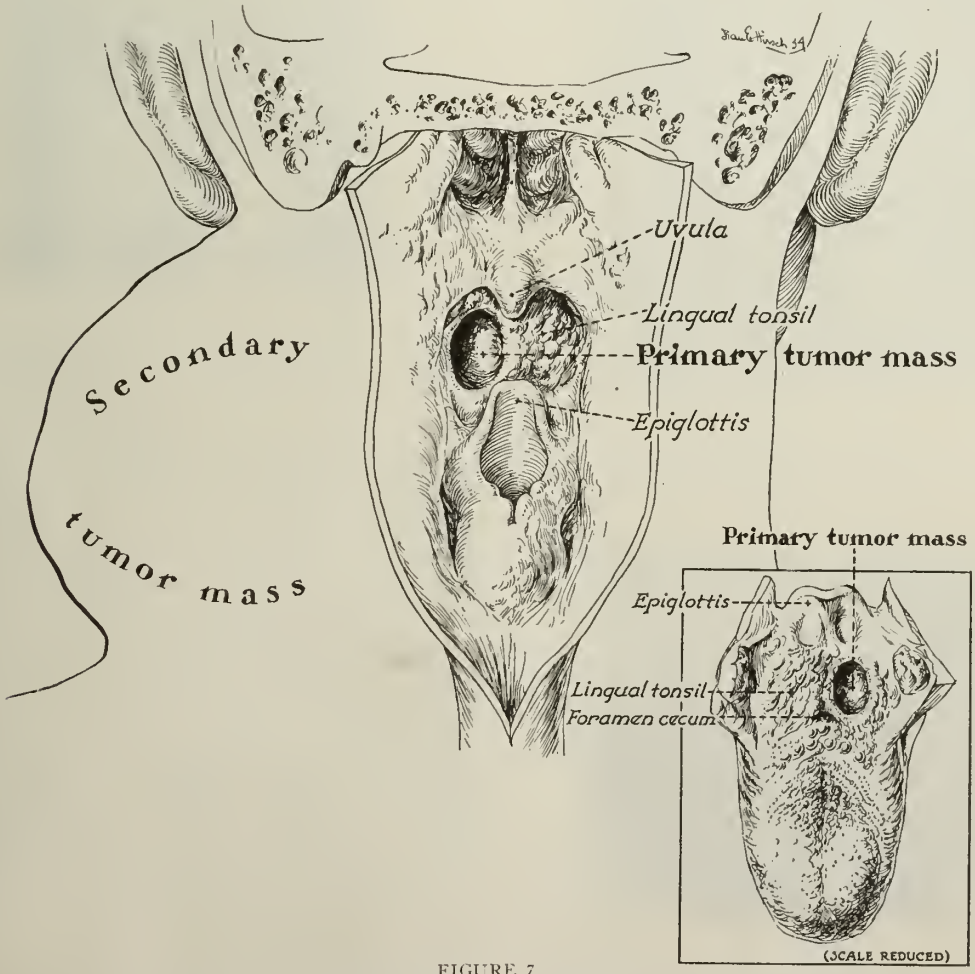


FIGURE 7

Sketch of the relative size and position of the origin of a lymphoepithelioma in a lingual tonsil and the metastatic involvement of the neck.

gland enlargement. With so large a tumor mass, however, it seemed reasonable that the remains might be due to the fibrous structure or stroma of this enlargement and that the active portions of the neoplasm might have been destroyed. Nevertheless, the tumor is now growing again and we have biopsied a suspicious area at the site of origin in the lingual tonsil; this biopsy shows active tumor tissue. We now contemplate further X-ray and radium therapy, but tissue once radiated does not respond well a second time.

Cures in this type of case are difficult to obtain because the growth is usually so extensive when the patient is first seen. Cures do occur, however, and if this type of tumor is suspected when these obscure complaints previously mentioned are present, we will see these cases much earlier.

Case 8. Adenocarcinoma of the Nasopharynx

This patient was 37 years of age when first seen because of a difficulty in swallowing localized to the "back of the throat," and an increasing deafness in his left ear. His nose had bothered him for the previous twenty-one years with obstruction; recently, this had increased. He had undergone some nasal surgery about two years previous to his coming here but had not been relieved of his obstruction.

Local examination revealed a marked forward bulging of the posterior pharyngeal wall. The surface was smooth and rather firm. The tumor filled the pharyngeal cavity so well that it was difficult to be sure of the exact extent of the growth into the nasopharynx. The left side of the pharynx was more involved than the right side, and the lower level of the mass was at the level of the base of the tongue. Figure 8 represents the lateral X-ray view of the pharynx and gives some idea of the size of the tumor.



FIGURE 8

A lateral x-ray view of a pharynx showing the outline of the tumor mass in a case of an adenoncarcinoma originating in the pharyngeal wall.

The left ear drum showed evidence of chronic middle ear infection but the drum was not perforated at this time. Hearing tests indicated a marked loss of acuity of the mixed type. There was an abundant purulent discharge from both nasal meati.

Operation was performed under a general anaesthetic. The tumor mass was fully exposed by splitting the soft palate in the midline through the uvula. Preceeding this, the left external carotid artery had been ligated. An incision was then made through the anterior surface of the tumor which exposed a soft material which came away easily with the examining finger. The tumor substance was thoroughly curetted out. The origin had apparently been in gland structure in the retropharyngeal space. The periphery of the wound was implanted with eleven millicuries of radium emanation giving a total of 1,452 millicurie hours, and the wound was left open. The palate was resutured. Recovery was uneventful, the nasal respiration was restored and the infection in the nasal space subsided. Today, it is almost a year since the operation. The original site of the tumor has healed and he is clinically well. Microscopic study of the tumor tissue revealed an adenocarcinoma of the mixed type.

Case 9. Carcinoma of the Epiglottis

This gentleman is 65 years of age. He came to us recently with the complaint that he felt as if he had "a sliver in the throat" for three months. He experienced some discomfort with each attempt to swallow. It was more marked on the left side. He localized the irritation as just below the left submaxillary area.

Examination with the laryngeal mirror revealed an ulcerated edge on the left side of the epiglottis beginning close to the midline and extending for about 1.5 centimeters down the left margin. Clinically, it appeared to be a malignant growth. There were no palpable glands in the neck.

The growth was studied further with the patient in laryngeal suspension. Its extent was determined to be as originally described. A frozen section revealed a squamous cell carcinoma which was classified as a grade 2. The growth was widely removed with surgical diathermy. It is now about three months since this was done. The site of operation has healed and he is clinically well. I feel that our chances in this case are excellent for a cure. The tumor was a slow growing type and the diagnosis was an early one.

Case 10. Carcinoma of the Larynx

This patient claims that he is 71 years of age; it is obvious he is well preserved. Four weeks ago, he had his larynx completely removed. He made a rapid and uneventful recovery. This trachea tube is still being worn as there is a fair amount of secretion and irritation related to the deep X-ray therapy which he has just completed. His artificial larynx is attached temporarily to the trachea tube, and when the latter is permanently removed, an attachment to fit over the tracheal opening will be supplied to him. (Figure 9).



FIGURE 9

Case of carcinoma of the larynx five weeks after a total laryngectomy. The artificial larynx is temporarily attached to a tracheal cannula.

The history in this case is very interesting. About six months ago, he consulted a physician because of hoarseness; apparently he had had this symptom for about six months previous to this. A growth was noted in the larynx and a biopsy taken, which was reported to be a papilloma. This was cauterized. The patient did not return to his physician for a follow-up as requested but remained away for several months during which time the hoarseness apparently increased and stridor developed. Finally, he returned when a tracheotomy was necessary. Another biopsy at this time revealed a squamous cell carcinoma, grade 3; he was then referred to us for treatment.

This is the larynx which was removed. I shall pass it around and you will not that the growth involves both vocal cords and extends in to the subglottic space. Whether it began on a cord and grew downward or started in the subglottic space and grew upward is a matter for speculation. I am inclined to believe that it began in the subglottic area because of less prominence of the lesion in the true cords, and that the symptom of hoarseness was not marked until he had been aware of stridor for some time. However, the history in this case is not very reliable since the patient is inclined to show very little concern over his discomforts.

Here is another specimen which shows a less extensive growth but in which there is a longer history than in the case just presented. This one began on a vocal cord on one side and still remains localized to the cord and the immediate subglottic area. In the case of this man of 62 years (Figure 10), the first symptom was hoarse-



FIGURE 10

Case of carcinoma of the larynx four weeks after removal of the larynx. The wound has about healed and the patient is about to be fitted with an artificial larynx.

ness. The history of this symptom extends over 15 months. He was first treated with sprays, then with chiropractic, and finally had his larynx examined with a laryngeal mirror. *This little inexpensive instrument is neglected.* It should be part of the equipment necessary to every physical examination. The technic for its use is simple. It requires a little practice but any physician who takes the responsibility of giving treatment or advice for throat conditions is obligated to use the laryngeal mirror.

You will note in these two specimens that we are well outside the malignant growth and that the tumor is apparently confined to the cavity of the larynx with its surrounding cartilaginous framework. I anticipate a cure in each case.

(Continued on Page 548)

Carcinoma of the Breast; Surgical Treatment and Results Three, Five, Ten, Fifteen and Twenty Years After Radical Amputation*

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THE importance of careful consideration of all lesions of the mammary gland is evident in the fact that this gland is one of the most common sites of malignant disease in the female. The fundamental principles of the generally accepted treatment by radical amputation for carcinoma of the mammary gland were set forward by Halsted and by Willy Meyer working independently in 1888. Theirs was an epoch making contribution to the treatment of carcinoma of the breast, for since their publications surgical treatment has been the most effectual method of combating the disease.

The technic of the radical operation has been fairly well standardized, and the results have not been improved by extending the operation to include other regions. However, the present results can be greatly improved if operation is performed earlier in the course of the disease, before it has spread beyond the limits of the operative field.

Early diagnosis is the most important consideration in surgical treatment of mammary carcinoma. There are no pathognomonic signs or symptoms by which all mammary malignant growths can be recognized. This unfortunately, is particularly true of early lesions. This fact emphasizes the importance of considering every lesion of the breast as possibly malignant, because delay in treatment may result in death from metastasis of a malignant lesion. The educational program which members of the medical profession have participated in, for many years, has been of great benefit in that a greater number of patients are seeking medical advice for conditions of the breast, earlier in the course of the disease. This increases the responsibility of the physician, for lesions of the breast are seen before the characteristic signs of malignant lesions are present, and it is often difficult to distinguish benign from malignant lesion on the basis of clinical signs and symptoms.

In those case in which carcinoma is suspected, and in the cases in which diagnosis is definite, the subsequent course and planning of treatment should be carried out by one who is thoroughly familiar with the management for lesions of the breast. The initial treatment is by far the most important procedure and the possibility of cure often depends on its effectiveness.

The following study of the signs and symptoms of malignant disease of the mammary gland, and of the indications and methods of surgical treatment of such lesions, is based on a series of 4,038 cases in which operation was performed from 1910 to 1930 inclusive. The surgical statistics and results of operation are based on 3,740 cases of unilateral carcinoma of the breast in which operation was performed between 1910 and 1930, inclusive, thus permitting the compilation of results over a period of three, five, ten, fifteen and twenty years from the time of operation. In a subsequent paper I shall report on the bilateral adenocarcinomas, epitheliomas, and sarcomas which comprise the remainder of this series. Much of the clinical material has been reported previously.

That malignant disease is not confined to any definite period of life is evidenced by the age incidence in this series. The youngest patient was seventeen years of age and the oldest eighty-five. The greatest incidence was in the decade between forty-five and fifty-four years, in which 34.8 per cent of the cases occurred. The next decade in frequency of occurrence was that between thirty-five and forty-four years, which represented 25.3 per cent of the cases; the third was fifty-five to sixty-four years, which represented 23.2 per cent.

The most common clinical sign of malignant disease of the breast is the presence of a painless tumor to which the overlying skin is fixed. The tumor is usually irregular in size, hard, infiltrating into the tissue of the breast, and usually not movable. A definite tumor was found in 93 per cent of the cases in this series; in 98 per cent of these it was single, and in 2 per cent, multiple. In 6 per cent of cases the tumor was not definitely demarcated, and there was diffuse infiltration of the entire breast. In 0.6 per cent of cases there was no palpable tumor.

The most common site of the tumor was the

*Read before the South Dakota State Medical Association, Mitchell, S. D., May 16, 1934.
†Division of Surgery, The Mayo Clinic.

upper, outer quadrant of the mammary gland, where it occurred more than twice as frequently as in any other part of the breast.

Recognition of malignant disease of the breast by the clinical signs and symptoms depends on the duration of the lesions at the time of examination; these signs and symptoms are hopelessly inadequate in determining early malignant disease. If sufficient time were permitted to elapse, it is probable that all of these conditions could be diagnosed clinically, but meanwhile much valuable time would be lost before the institution of treatment, and in most instances the patient would lose any possibility of obtaining permanent cure from surgical treatment.

The subjective sensation of pain, and the absence of pain, in cases of lesions of the breast, are often of value in establishing a diagnosis, but these symptoms are probably the most misinterpreted and most unreliable of all symptoms referable to the breast. In approximately 70 per cent of the cases of this series, pain was not associated with the lesion of the breast. This fact is exceedingly unfortunate, as it is probably one of the most common reasons why patients who have lesions of the breast delay in seeking medical advice. Pain not uncommonly accompanies lesions in which the malignant disease is well advanced. The old adage which has gone down through time, namely, "Don't bother a tumor until it bothers you," has probably caused more delay in the institution of proper treatment, and more suffering, than any other similar rule. Although malignant lesions of the breast are rarely painful, there is a small group of cases in which pain draws the patient's attention to the tumor. In this series, this group was found to be 8 per cent. It is unfortunate that this percentage is so small, for patients will seek advice for painful lesions much more quickly than they will seek it for non-painful lesions. The pain is rarely severe, and is often difficult for the patient to describe, but usually it is mentioned as a transitory, burning type of pain, or a sharp, stabbing pain, or in the nature of a pin-prick. Occasionally there is a sensation of itching. This is particularly noted in lesions close to the nipple. Another group of patients complain of more severe and constant pain at the site of an indefinite, infiltrating type of tumor. Patients of this group constituted about 4 per cent of this series. The importance of pain in lesions of the breast, I do not believe can be overestimated, either from the standpoint of education of the laity or from that of members of the medical profession. All should recognize the seriousness of tumor in the absence of pain, but there is a definite group of cases in which pain is one of the prominent symptoms.

Fixation of the skin over the tumor is the most characteristic sign of malignant disease. This fixation of the skin is due to malignant infiltration of the subcutaneous tissues, and of Cooper's suspensory ligaments of the skin, and may be considered to be of three different types. The first type may be classified as that in which there is some mobility of skin over the lesion, but the lesion is found to be definitely attached when an attempt is made to mobilize the skin. This is found when lesions are deep in the tissue of the breast, or when they are in a very early malignant stage. The second type is that in which there is definite dimpling of the skin over the site of the tumor. The third group is that seen when there is ulceration of the skin over the tumor; this ulceration is noted in association with lesions of long standing. One of these three types of fixation of the skin was seen in 82 per cent of cases in the series, and it is unfortunate that the average percentage of cases in this series in which lesions were ulcerated was 6. In 1930, the percentage of cases in which there was ulceration was 8, which indicates that the educational campaign has not been sufficiently effective, and that patients are being seen too late in the course of the disease for best results from surgical treatment to be expected. In studying this group of cases with reference to the presence or absence of lymphatic involvement, it was found that in 72 per cent there was metastasis to the regional lymph nodes, which indicates that if fixation of the skin has occurred, metastasis will have taken place in approximately three-fourths of the cases.

The cases were studied also with reference to the duration of the tumor at the time of examination, in order to see if patients with malignant disease are presenting themselves earlier for examination. The results were somewhat discouraging. The average duration of the lesion, taken year by year from 1910 to 1930, was seventeen and four-tenths months. In 1910 and 1911 the duration was thirty-one and two-tenths and twenty-nine and six-tenths months, respectively. From 1912 to 1927, the duration varied from twenty-three and nine-tenths to twelve and nine-tenths months. From 1927 to 1930 the duration was from fourteen and four-tenths to eleven and seven-tenths months. These data are of practical importance, for although there has been a slight decrease in duration of the tumor in recent years, it indicates that malignant lesions of the breast are being seen too late in the course of the disease to insure the best surgical results.

In reviewing all lesions of the breast, benign and malignant, I found that the average duration of the lesions was approximately five months, and that about 40 per cent more of benign lesions are being seen now than were seen five years ago. This increase in the percentage of benign lesions accounts for the decrease in duration of the lesion in all cases of disease of the breast. I believe that this high percentage may be largely accounted for by the pain so commonly associated with benign lesions, and that it is probable that the importance of treatment of painless tumors is not being sufficiently stressed in the educational program.

I do not believe that the presence or absence of metastasis to lymph nodes can be definitely ascertained on clinical examination in all cases. In the cases observed in the last year, palpable nodes were found in 60 per cent, in 68 per cent of which definite axillary metastasis was found at the time of operation. In the remaining cases the enlarged nodes were found to be inflammatory. In the 40 per cent of cases in which enlargement of the axillary nodes was not found clinically, axillary metastasis was present in 29 per cent. In these cases the metastatic nodes were under the pectoral muscles along the axillary vein where they could not be felt on clinical examination. In view of the frequency with which these palpable nodes are found to be inflammatory on microscopic examination, I do not believe a surgeon is justified in refusing operation because of their presence.

I have tabulated the percentage of cases in which there was lymphatic involvement at the time of operation from 1910 to 1930. The average percentage was 64.2 and there was little variation in this percentage from that of the last ten years. In 1930 the percentage was 62.4. This again indicates that patients are being seen too late in the course of the disease for the best results from surgical treatment to be expected. I also studied this group of cases to determine the percentage of cases in which there was lymphatic involvement, in the different decades of life, and found that there was very little variation in the percentage of involvement according to age. Of patients between the ages of fifteen and twenty-four years, 57.1 per cent had lymphatic involvement; between the ages of twenty-five and thirty-four 63.0 per cent; between the ages of thirty-five and forty-four, 65.6 per cent; between the ages of forty-five and fifty-four, 64.3 per cent; between the ages of fifty-five and sixty-four, 66 per cent; between the ages of sixty-five and seventy-four, 58.2 per cent, and between the ages of seventy-five and eighty-four, 42.3 per cent. This shows that the greatest percentage of lymphatic involvement occurs in the group between thirty-five and sixty-four years of age and it is during this period that the greatest incidence of carcinoma of the breast is seen.

From a surgical standpoint, the most important lesions of the breast are those in which a definite diagnosis cannot be made clinically, and in which the question arises as to whether it is best to keep the patient under observation or to treat the condition surgically. In all cases in which there is a single, localized tumor, without difinite clinical signs of malignant disease, the only safe course to follow to establish a definite diagnosis is surgical removal of the tumor and microscopic examination. The tumor should be removed by wide excision, well away from the limits of the growth, and without trauma to the lesion. Usually I prefer to remove a wedge-shaped piece of tissue including the tumor. The microscopic examination of the tumor should be made immediately after its removal, before the wound is closed. If the tumor proves to be malignant, the operation should be completed as a radical amputation; if it is benign, the breast can be reconstructed with very little deformity. If microscopic examination of the removed tissue discloses a proliferative type of mastitis, such as Schimmelbusch's disease, the entire breast should be removed, the operation being completed as a simple amputation.

I do not believe that it is ever justifiable to remove any growth from the breast without immediate examination of a frozen section of the tissue; the manner of completing the operation is indicated by the results of this examination. The poorest surgical results in carcinoma of the breast are obtained from secondary radical amputation after primary partial removal of the tumor. In a review of this series, I found that in 11 per cent of the cases a primary minor operative procedure had been carried out. The secondary operation was radical amputation. In this group lymphatic involvement had occurred in 79 per cent, as compared with 64 per cent in those in which primary radical amputation had been done. The results of secondary radical amputation are correspondingly less satisfactory. These figures, however, do not give the true results in those cases in which a primary minor operative procedure had been done, because in approximately 50 per cent of these, secondary operation had not been done, the condition being hopelessly inoperable at the time the patients presented themselves for examination. This is particularly true of cases in which some type of escharotic had been used on the breast, as more than 80 per cent of these were inoperable.

Technic of Radical Amputation

The best surgical results are obtained by primary radical amputation. The technic of this procedure has been fairly well standardized. I do not make a uniform type of incision in the skin, for I believe that the best results are obtained when the incision is planned in each case so as to remove the greatest amount of skin, over the region of disease and to leave the least deformity and the least restriction of motion of the arm. If the incision is properly planned, in accordance with the situation of the tumor, sufficient skin can be removed so that there is little danger of local recurrence, and skin grafting is rarely necessary except when the lesions are most extensive. In general, if the tumor is in the upper or lower quadrant of the breast, a vertical incision will give the best results in complete removal of the growth and in adequate exposure for deep dissection. If the growth is in the extreme inner or outer quadrant of the breast, a transverse incision is usually best.

After the incisions in the skin have been outlined, the subcutaneous tissue is dissected around the entire operative field, the median portion of the dissection being carried to the median line; the lateral portion, to the border of the latissimus dorsi muscle, extending below to include the tissue over the upper portion of the fascia of the rectus muscle and above, to the clavicle. Approximately two-thirds of the clavicular portion of the pectoralis major muscle is then divided, and its attachment is severed from the humerus. The lymph nodes along the upper portion of the brachial vessels are thoroughly removed, and the dissection is carried to the lower border of the pectoralis minor muscle. The attachment of this muscle to the coracoid process of the scapula is severed. The dissection of the axillary and sternal lymph nodes is completed, and all of the nodes are removed along the lateral wall of the thorax, along the axilla, both above and below the axillary vessels, to the entrance of the axillary vein into the thoracic wall. The branches of the axillary vessels are caught and ligated as the dissection of the lymph nodes proceeds toward the sternum; the long thoracic and subscapular nerves are preserved. This completely outlines the tissues to be removed, which are still attached to the wall of the thorax; they include the breast, subcutaneous tissue, axillary nodes and node-bearing fascia, the pectoralis minor muscle, and the greater portion of the pectoralis major muscle. These structures are then dissected from the wall of the thorax, starting from the lateral aspect; the perforating intercostal vessels are ligated as the dissection proceeds. The anterior sheath of the rectus muscle is removed as the dissection proceeds toward the median line, and the entire carcinomatous portion is removed in one mass.

Three, Five, Ten, Fifteen and Twenty Year Results in 3,740 Cases in Which Operation Was Performed from 1910 to 1930

The results of operation depend on four important factors: (1) the extent of the disease at the time of operation, (2) the thoroughness with which the operation is performed, (3) the degree of the malignancy at the time of operation, and (4) the age of the patient.

Statistical studies are often misleading and often do not give the true conception of the results obtained. The first important consideration is the extent of the disease at the time of operation. This depends on where the line is drawn between operable and inoperable conditions, and I believe that this is one of the most important factors in statistical studies because, if only the small lesions, without demonstrable axillary metastasis should be considered surgical, the statistical results would be very satisfactory. This, however, would include only a relatively small number of patients, for the majority of patients present fairly well advanced lesions at the time of their initial examination. In this group of cases in which there are more extensive lesions, with ulceration and axillary metastasis, comfort and additional life can be given by proper surgical treatment, and the patients deserve the benefit of this treatment. There are varied opinions as to what constitutes an operable case. I will state briefly the criterion of operability followed in this series. Any lesion of the breast was considered operable if it was freely movable from the thoracic wall, regardless of ulceration. In some cases, even if there were cutaneous nodules proximal to the tumor, regardless of the presence or absence of palpable axillary lymph nodes the lesion was considered operable, and the same view of operability was held in most cases in which supraclavicular nodes were palpable but were confined to one side. Also patients were accepted for operation if they had the diffuse type of malignant growth, if malignancy was associated with lactation, and in most cases, if malignancy was associated with pregnancy. Those conditions were considered inoperable in which a large growth was fixed to the thoracic wall and there was very extensive metastasis to the regional lymph nodes or distant metastasis to other parts of the body. A few cases in which there was distant metastasis were accepted for operation because of exceptional cir-

cumstances. It is difficult to draw any sharp line between operable and inoperable lesions, and in each case treatment must be according to the findings. I have accepted for operation all patients to whom, I felt, there was a reasonable chance of offering comfort or greater length of life, as well as those patients whose disease, I felt, there was a reasonable chance of curing. It may seem that these rules of operability have not been drawn strictly enough, and that I am accepting for operation cases in which the growth is too extensive. This is a matter of opinion, and the justification is found in many cases in which the condition was thought to be absolutely hopeless before operation, but in which the patients have lived and enjoyed many years of comfort following the procedure. All patients operated on have been included in the surgical results, regardless of the extent of the disease at the time of operation; this includes a high percentage of cases in which all that could be hoped for was palliation. It also includes those cases in which a primary operative procedure had been carried out elsewhere, and I performed radical amputation; such cases, which constitute 11 per cent of the entire series, should be classed as secondary radical amputations. Table 1 gives the results of radical amputation for unilateral carcinoma of the breast from 1910 to 1930.

TABLE 1
THREE, FIVE, TEN, FIFTEEN AND TWENTY YEAR RESULTS OF RADICAL AMPUTATION FOR UNILATERAL CARCINOMA OF THE BREAST
(From 1910 to 1930 Inclusive)

	Total Cases	Results of Operation, Per Cent—Living— 3 Years	5 Years	10 Years	15 Years	20 Years
Without involvement of lumph nodes (32.5%)	1,214	81.5	72.5	50.2	36.4	21.2
With involvement of lymph nodes (67.5%)	2,526	41.1	26.9	13.0	8.6	6.9
Total	3,740	54.1	40.9	24.4	17.2	11.7

The most valuable indications as to prognosis in cases of carcinoma of the breast are the degree of malignancy and the extent of the disease as indicated by the presence or absence of lymphatic involvement. Broders, studying tumors removed from the breast since 1910, has reviewed 2,879 of the entire series of 4,038 cases, and this I believe is a sufficient number on which to base a preliminary report.

Of the 2,879 cases, the malignancy in 2.9 per cent was found to be of grade 1; in 12.2 per cent, of grade 2; in 33.6 per cent, of grade 3, and in 51.3 per cent, of grade 4. Lymphatic involvement was found in 14.3 per cent of cases in which malignancy of the carcinoma was graded 1; in 48.1 per cent of those in which it was graded 2; in 76.6 per cent of those in which it was graded 3, and in 88.6 per cent of those in which it was graded 4. This shows that the majority of the carcinomas were highly malignant; 84.9 per cent of the entire series were of malignancy graded 3 and 4. The significance of this, from the standpoint of prognosis, is emphasized by the high percentages of cases of these two groups in which there was lymphatic involvement; in 76.6 per cent of cases in which malignancy was graded 3, and in 88.6 per cent of cases in which it was graded 4. It would seem that most carcinomas of the breast metastasize early to the regional lymph nodes.

The cases were also studied to determine if there was any definite relationship between the age of the patient and the degree of malignancy in cases in which there was lymphatic involvement, and between the age of the patient and the degree of malignancy in cases in which lymphatic involvement was absent. First, cases in which there was lymphatic involvement will be taken up. Of these the average age of patients with carcinoma graded 1 was forty-five and eight-tenths years; of those with carcinoma graded 2, fifty years; of those with carcinoma graded 3, fifty years, and of those with carcinoma graded 4, fifty and one-tenth years. The average age of corresponding patients without lymphatic involvement was forty-eight and five-tenths years, fifty-one and eight-tenths years, fifty and nine-tenths years and fifty-two and one-tenth years, respectively. Little variation was shown in the average age of patients presenting the four different grades of malignancy.

For each of the four grades of malignancy, the surgical results following radical amputation in cases in which lymphatic involvement was present were compared with those in which it was absent. It was found that of the 2,231 cases in which lymphatic involvement was present in 0.6 per cent the lesions were graded 1; of these patients 100 per cent lived three years, 100 per cent lived five years, and 80 per cent lived ten years. In 7.6 per cent of the cases, the lesions were graded 2; of these patients, 69.4 per cent lived three years, 49.1 per cent lived five years, and 38.1 per cent lived ten years. In 33.2 per cent of the cases the lesions were graded 3; of these patients 49.2 per cent lived three years, 26.9 per cent lived five years and 10.3 per cent lived ten years. In 58.7 per cent of the cases the lesions were graded 4; of these patients, 34.4 per cent lived three years, 19.4 per cent lived five years, and 11.3 per cent lived ten years. In the total number of cases in which there was lymphatic involvement (all grades included), 42.2 per cent of the patients lived three

years, 25 per cent lived five years and 13.7 per cent lived ten years.

Th total number of cases in which lymphatic involvement was absent was 648; 77.6 per cent of these patients lived three years, 66.4 per cent lived five years, and 49.0 per cent lived ten years. In 11.1 per cent of these cases the lesions were graded 1; of these patients, 95.1 per cent lived three years, 93.1 per cent lived five years, and 83.3 per cent lived ten years. In 28.1 per cent of the cases lesions were graded 2; of these patients 88.5 per cent lived three years, 76.4 per cent lived five years, and 48.7 per cent lived ten years. In 34.9 per cent of cases, in which lesions were graded 3; 73.4 per cent of the patients lived three years, 61.8 per cent lived five years, and 46.9 per cent lived ten years. In 25.9 per cent of cases in which lesions were graded 4; 67.6 per cent of the patients lived three years, 54.4 per cent lived five years, and 38.8 per cent lived ten years.

This shows a definite and uniform relationship between the operative results and the degree of the malignancy, in that the lower the degree of malignancy the higher the percentage of patients who lived three, five and ten years after operation. It also shows that the surgical results are much more satisfactory in cases in which lymphatic involvement is absent than in cases in which such involvement is present. This was found to be true in the presence of all grades of malignancy. The grading of malignant tumors of the breast is, therefore, of great practical value as an index of prognosis in cases in which radical operation has been performed.

I am at present making an analysis of all cases of carcinoma of the breast to determine the prognosis in relation to the age of the patient at the time of operation. The following is a preliminary report based on a series of 3,740 cases. The report comprises a riview of the cases in which the patients have been definitely traced, and cases of which we have complete records, which is 95.1 per cent of all cases in which operation was performed from 1910 to 1930. This study indicates that the younger the patient at the time of operation for carcinoma of the breast, the poorer the prognosis, particularly for the first three years after operation. After the first three years, following operation, however, the difference in the prognosis as gauged by the ages of the patients, is not so great. Of course, it must be recognized that there is a normal mortality rate from other causes among these patients, and that this rate is much greater the older the patient is at the time of operation. My tables have not been corrected to compensate for this increase in death rate in the older decades of life, which further indicates that the death rate from carcinoma alone is greater the younger the patient at the time of operation. Although the death rate is higher in the younger decades of life, it is gratifying to see that a relatively high percentage of the younger patients survive five and ten years after radical amputation.

I am endeavoring to complete the records on the remaining 5 per cent of cases, and after these records have been obtained, to 100 per cent, I expect to make a further report on this study and also to complete the report on the prognosis, according to the grades of malignancy, in the various decades of life.

Tables 2, 3, 4, based on 3,740 cases of carcinoma of the breast in which operation was performed from 1910 to 1930, show the age of the patients at the time of operation, divided into half decades after thirty years of age. They also show the percentage of patients, in each of the half decades, who have survived operation one, two, three, five, and ten or more years. Table 2 is based on the entire group. Table 3 is based on 2,526 cases

TABLE 2
CARCINOMA OF BREAST, TOTAL GROUP
(3,740 Cases)

Age at Operation, Years	Survival After Operation, Per Cent				
	1 Year or More	2 Years or More	3 Years or More	5 Years or More	10 Years or More
15 to 29.....	74.0	60.0	60.0	49.5	46.6
30 to 34.....	77.7	60.4	49.7	39.2	32.8
35 to 39.....	81.4	64.2	54.1	40.9	32.8
40 to 44.....	85.1	67.2	56.7	42.6	33.6
45 to 49.....	84.2	67.6	56.3	46.0	34.8
50 to 54.....	88.1	74.3	61.3	52.5	38.8
55 to 59.....	83.6	66.6	54.6	43.7	30.8
60 to 64.....	83.5	68.8	56.4	44.1	27.6
65 to 69.....	86.2	73.3	61.8	46.6	32.2
70+	84.7	66.7	55.1	41.0	24.1

TABLE 3
CARCINOMA OF BREAST, WITH LYMPHATIC INVOLVEMENT
(2,526 Cases)

Age at Operation, Years	Survival After Operation, Per Cent				
	1 Year or More	2 Years or More	3 Years or More	5 Years or More	10 Years or More
15 to 29.....	66.7	45.5	45.5	30.0	26.3
30 to 34.....	72.0	50.8	37.3	26.3	17.7
35 to 39.....	74.2	50.4	37.5	21.5	14.9
40 to 44.....	78.3	54.7	42.1	28.2	20.8
45 to 49.....	77.5	54.6	39.8	28.5	18.0
50 to 54.....	83.8	66.6	49.7	40.4	26.4
55 to 59.....	70.0	54.9	40.7	28.1	16.5
60 to 64.....	79.8	61.8	47.9	34.1	20.9
65 to 69.....	81.3	64.1	50.2	34.0	15.7
70+	78.3	54.3	41.3	26.9	16.5

TABLE 4
CARCINOMA OF BREAST, WITHOUT LYMPHATIC INVOLVEMENT
(1,214 Cases)

Age at Operation, Years	Survival After Operation, Per Cent				
	1 Year or More	2 Years or More	3 Years or More	5 Years or More	10 Years or More
15 to 29.....	88.2	88.2	88.2	88.2	88.2
30 to 34.....	88.5	78.7	73.8	63.5	60.4
35 to 39.....	94.3	89.3	84.3	77.0	66.0
40 to 44.....	98.5	92.0	85.6	76.7	63.0
45 to 49.....	96.9	92.2	87.6	79.0	66.6
50 to 54.....	95.5	87.5	81.6	73.2	59.3
55 to 59.....	95.7	88.2	80.3	71.9	56.3
60 to 64.....	91.7	84.3	75.2	65.5	42.1
65 to 69.....	95.7	89.3	81.6	67.9	56.5
70+	91.3	79.2	69.3	56.3	29.2

in which there was involvement of lymph nodes at the time of operation; those 2,526 cases constitute 67.5 per cent of the total group. Table 4 is based on 1,214 cases in which there was no involvement of the lymph nodes at the time of operation; these 1,214 cases constitute 32.5 per cent of the total group.

Summary and Conclusions

The educational program of the medical profession has been of aid in bringing to examination a greater number of patients with lesions of the breast. It has increased the responsibility of the physician in establishing the diagnosis in early cases of malignant disease.

The subjective symptoms and physical findings are usually inadequate in determining early malignant disease. In all doubtful cases the tumor should be removed for microscopic examination, to be followed immediately by radical amputation if the lesion proves to be malignant.

Marked progress has not been made in the institution of surgical treatment early in the course of malignant disease of the breast as is indicated by the percentage of cases in which lympth nodes have been involved at the time of operation. This percentage has remained approximately the same for the past ten years, and has averaged 67 per cent.

The best surgical results are obtained from primary radical amputation in cases of unilateral carcinoma of the breast in which metastasis to lymph nodes has not taken place. In a series of 3,740 cases studied, 82 per cent of the patients were living three years, 73 per cent five years, 50 per cent ten years, 36 per cent fifteen years, and 21 per cent twenty years after operation. In cases in which there has been lymphatic involvement, the results are not as satisfactory but probably are more favorable than in cases in which metastastic malignancy has occurred elsewhere in the body. In this group, 41 per cent of patients were living three years, 27 per cent were living five years, 13 per cent were living ten years, 9 per cent were living fifteen years and 7 per cent were living twenty years after operation. The poorest surgical results were obtained in cases in which secondary radical amputation is done following primary, partial amputation.

The important indications as to prognosis following radical surgical treatment are the extent of the malignancy at the time of operation, particularly as to absence or presence of axillary lymphatic metastasis, the thoroughness with which the radical operative procedure is performed, the degree of the malignancy which is indicated by the microscopic examination of the primary malignant lesion, and the age of the patient.

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A Clinic on Cancer of the Nose and Throat

(*Continued from Page 541*)

Cancer in the laryngeal cavity gives an early warning in the form of *hoarseness,* remains localized in the larynx for a long period, and is curable by a relatively simple operation in a very high percentage of cases when it is limited to the anterior two-thirds of one vocal cord. While still within the laryngeal cavity, it is curable in a high percentage of cases by a total removal of the larynx. When cancer begins on the outer surface of the larynx, there is no distinct early warning. *We must be suspicous of obscure symptoms.* We must suspect any sense of discomfort localized to the general area of the larynx. The statements that the patients make are often these:

"I have a raw spot in my throat."

"There seems to be something stuck in my throat."

"I can't clear my throat."

"There is more phlegm than there used to be and I can't get rid of it."

In the presence of any of these statements, a careful study of the lower pharynx and larynx is necessary with the laryngeal mirror. Pain, swelling, hoarseness, and dysphagia are late symptoms of cancer beginning on the outer portions of the larynx.

The Tuberculous Teacher a Real Danger to the Pupil

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UNTIL recently tuberculosis was considered an inherited disease, and it was thought very little could be done about it. A better knowledge has brought to us the realization that tuberculosis is not inherited but that infection occurs after birth in practically every case. It is true that tuberculosis as a clinical and often fatal disease is more common in families giving histories of having had it, and it may frequently occur in several generations of the same family. This is not because it is inherited but is transmitted from one member of the family to another by intimate contact. If the same association was with some one other than a member of the family the danger would be equally as great.

Much work has been done at the Southwestern Minnesota Sanatorium to determine the cause of infection by means of the tuberculin test. It was found that over 80 per cent of the children coming from homes where some member of the family was an open case of tuberculosis was infected. A similar study made on children associating in the home where there was an open case of tuberculosis in some one (such as servants, farm hands, boarders, etc.) not a member of the family, the incidence of infection was also over 80 per cent, or practically the same as when exposed to a relative in the home. It is therefore quite evident that the danger of infection is great when the child is exposed to an open case of tuberculosis regardless of whether the patient is a relative or other person. The family will no doubt always be the greatest source of infection but other sources must not be overlooked.

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In this article Dr. Slater has called attention to a tuberculosis problem which should be easily and quickly solved. Moreover, he has presented an adequate method for its solution. Through careful examination of teachers everywhere, a considerable number will be found who have no external manifestations of tuberculosis, but who have definite disease which will eventually cause disability and which will spread to their associates. Such persons may be successfully treated before they actually become ill and in due time restored to normal working capacities. Thus, they are saved and their fellow teachers avoid contamination, as well as their pupils. School boards everywhere should demand examinations just as Dr. Slater advocates, in order to protect children against tuberculosis. On the other hand, teachers should use their influence in securing periodic examinations of all children in order to protect the members of their profession. The procedure outlined by Dr. Slater will do much to enlist the interest and support of the teachers in the campaign against tuberculosis, which will be a great step toward the ultimate eradication of this disease. J. A. MYERS.

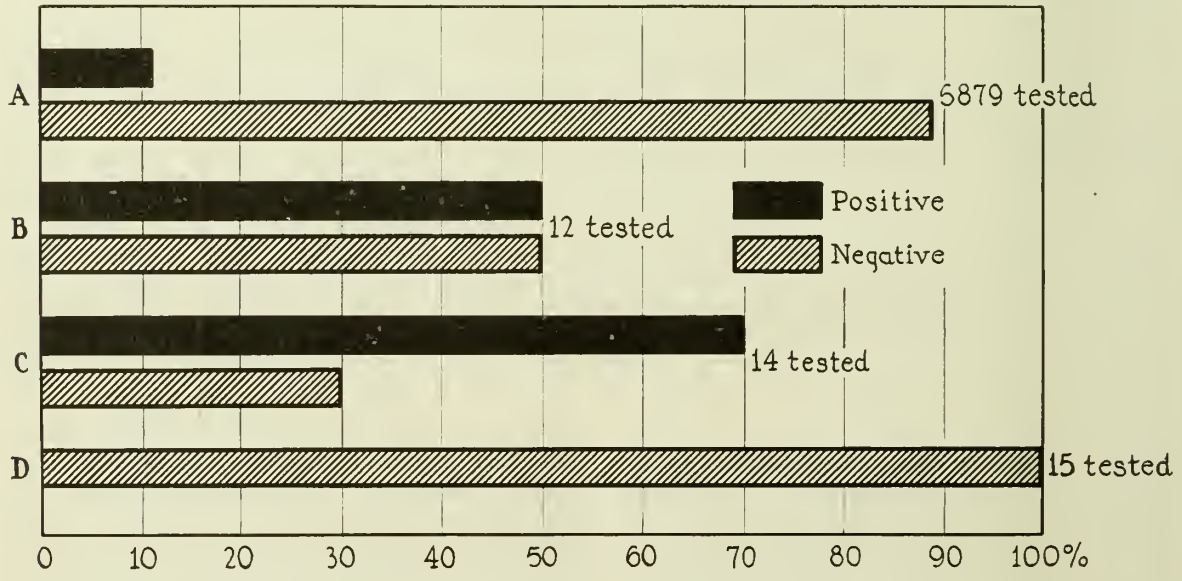
It is not the purpose of this paper to discuss infection in general but to call attention to one important but hitherto neglected source, namely, the teacher. Jordan and Jordan in Minnesota Medicine, September, 1933, showed her to be a real danger, and urged school boards to take precautions against employing any teacher who might have tuberculosis, and thus endanger the health of the pupils.

The following report will show even more conclusively how great a danger the tuberculous teacher may be. A teacher was admitted to the Southwestern Minnesota Sanatorium November 20, 1933. Examination following admission showed her to be a moderately advanced case of tuberculosis. Both lungs were involved and the sputum was loaded with tubercle bacilli. She had taught a year and two months in the school in which she was working at the time her case was discovered and previously taught two years in another school. Both of these schools were one room schools which made an ideal condition for the study of the pupils. Arrangements were made for a tuberculin test of the pupils and consent was obtained for the test to be given to every pupil. There were fourteen pupils from five families in her last school. The test showed that ten of the fourteen, or seventy-one percent were infected with tuberculosis. One or more children from each family was infected. The school in which she taught two years previous to her breakdown furnished a most interesting study. There were ten pupils, four reacted positively to the tuberculin test and six negatively. A study of the six who were negative showed that only

two had been in school any length of time under this teacher. Three had been under her less than three months and one not at all. Two children who had been her pupils but had since transferred to another school were also tested and both had a positive reaction. The study of the school showed that out of eleven of her pupils, six or fifty-four and five-tenths percent were infected with the disease. It also shows the insidiousness of tuberculosis for more than a year had lapsed since she had had contact with these pupils. It indicates that she had been a source of danger to the pupils long before the disease had reached a clinical form. It also emphasizes the fact that if tuberculosis is to be discovered before it reaches the advanced stage and before the patient becomes a source of danger, search must be made for it. The evidence so far obtained seems to show pretty conclusively that seventy-one per cent of the children in one school and fifty-four and five-tenths per cent of those in another had been infected by the teacher.

To have tested these two schools only and decided from the findings that the teacher was the sole cause of such a high percentage of infection would be unfair. The county Superintendent of schools was consulted and asked to select a school similar to the one the teacher taught in at time of break-down. A school was selected almost identical to the one in which seventy-one per cent of the pupils were infected. The only difference was that in this school there were sixteen children coming from ten families and the teacher was free from tuberculosis. Not one of these children was found to be infected with tuberculosis. All other things being equal one would think this one would be more likely to have infected children since more families were represented with two more children tested. The fact that none of these children last tested were infected seems to indicate that the teacher must have been the source of infection in the other schools which had seventy-one per cent and fifty-four and five tenths

(Continued on Page 554)



A. General survey of a number of town and rural schools.

Number of children tested	6,879
Number positive	767
Per cent positive	11.1

B. Rural School No. 12. Teacher, Miss X, taught school terms 1930-31 and 1931-32; was first examined November, 1933; physical and X-ray findings positive; tubercle bacilli present in sputum. All school children were Mantoux tested Feb. 19, 1934. All children from farm homes without family history of tuberculosis.

Number of families represented	7
Number children tested	12
Number negative	6
Number positive	6
Per cent positive	50
Period of attendance of children—	
(1) Positive reactors:	
Entire period	4
One and one-half years	2
(2) Negative reactors:	
No attendance	1
Two weeks	1
Two months	1
Three months	1
Entire period	2

C. Rural School No. 62; buildings and surroundings same type as No. 12. Same teacher as in B. Miss X taught school term of 1932-33 and two months of term of 1933-34. All school children were Mantoux tested Jan. 22, 1934. All children from farm homes. No family history of tuberculosis.

Number families represented	5
Number children tested	14
Number negative	4
Number positive	10
Per cent positive	70

All children attended entire period.

D. Rural School No. 31; school buildings and surroundings same type as No. 12 and No. 62.

Teacher, Miss A, had a negative reaction to the Mantoux test. All school children were Mantoux tested Feb. 19, 1934. All children from farm homes. No family history of tuberculosis.

Number families represented	10
Number children tested	15
Number negative	15
Number positive	0

The Care of Athletic Injuries to Soft Tissues*

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THE treatment of athletic injuries or, in other words, of acute trauma, necessitates a thorough understanding of the surgical pathology of traumatic lesions. Practically all of these lesions are primarily aseptic, but they are not infrequently secondarily infected. A consideration of the surgical pathology should first suggest the treatment of the acute trauma because adequate and proper treatment will often prevent subsequent infection.

The injuries most commonly associated with athletics are those to the soft structures of the body: The skin , muscles, tendons and ligaments. They usually arise from a blunt force, directly applied, or from a strain applied to the extremities through a lever type of action. The primary lesion is, therefore, one in which the soft structures are torn or bruised. This results, generally, in a rapid outflow of blood and lymph from the torn vessels. This stage of the traumatic lesion is called the stage of hemorrhage and and effusion, and it lasts, as a rule, for about eight to twelve hours after the injury. If appropriate treatment is given during this stage, the period of disability is greatly reduced. The indications for therapy are to prevent further injury and further hemorrhage. Hence, rest of the part, elevation, applications of cold to produce a vaso-constriction, and pressure are the therapeutic indications.

After the first eight to twelve hours, the hemorrhage usually has ceased and the effusion no longer increases. The hemorrhage gradually goes on to organization or disappears by absorption, and the repair takes place through the proliferation of connective tissue. In this stage, the therapeutic indications are to rest the part, to prevent further injury and hemorrhage and to permit the reparative processes to go on without interruption. Rest often consists of complete immobilization with splints or adhesive straps. Elevation of the part is of particular value because a more adequate venous and lymphatic drainage is obtained with a consequent decrease in the swelling and increase in the rapidity of absorption. Beginning as early as twenty-four hours after the injury, local heat may be applied to produce an active hyperemia and a more rapid absorption. Gentle stroking massage, increasing in depth as time goes on, hastens the absorption process. With these principles in mind, the treatment of traumatic injuries to soft tissues resolves itself merely into working out methods by which they may be applied to the injury at hand. The following remarks are some suggestions as to treatment which we have found useful for the common types of injuries sustained in athletics.

*Read before the fourteenth annual meeting of the American Student Health Association, Chicago, December 29, 1933.
†University of Pennsylvania.

Contusions

One of the commonest injuries, especially in football, basketball, soccer and lacrosse, is a bruise or muscle tear. These may occur at any place in the body but are most common and most disabling in the thigh and above the crest of the ilium in the loin. In these large muscle masses the hemorrhage is rapid. The most effective treatment during the early stage consists in the application of pressure dressings and external cold. In the thigh we have found elastic adhesive bandages (Elastoplast) to be of considerable value. This is applied as a circular dressing after a dry shave of the thigh. Its adhesive qualities hold it well in place and its elasticity permits a tight but not uncomfortable compression of the part. If the injury is seen early enough and the bandage snugly applied in an overlapping spiral around the thigh, extensive hemorrhage may often be prevented with a consequent shortening of the period of disability. Immobilization is not always necessary in the ordinary "charlie horse," but the firm bandage gives excellent support and may be left in place for as long as two to three weeks. The adhesive quality of the bandage is so good that it may be worn in showers without the necessity of removal and reapplication. Heat in the form of hot towels or by diathermy may be applied with the bandage still in place and massage may also be given in the later stages. Contusions of the loin, especially those received in football, often result in a tearing of the oblique muscles at the crest of the ilium. In such cases, pressure, cold and immobilization are the therapeutic indications. Pressure and immobilization are applied most effectively by the use of a criss-cross adhesive dressing. This strapping should be applied as soon as possible after the injury

and it should be permitted to remain in place for at least two weeks. After that time it may be removed for more intensive applications of heat and massage.

Not infrequently, injuries may not be seen for treatment until there is a considerable hematoma in the area of the contusion. If the hematoma is fluctuant, the disability may be considerably shortened by aspiration. A large 14 or 16 gauge needle should be used because, although fluctuation may be demonstrated, the blood in the hematoma is often in a semiliquid state and can be removed only with great difficulty through a smaller sized needle. The hematoma which is firm and hard can best be treated by an incision under local anesthesia with evacuation of the clot. The early removal of blood in the tissues reduces the amount of fibrosis and adhesions between muscles which are the chief factors in prolonging the disability. In some cases the hematoma may go on unnoticed to organization and calcification. Our experience has shown that under conservative treatment, if the trauma is not repeated, these calcified hematomata will often improve spontaneously.

Injuries to Joints

A second type of injury which is commonly seen is that to the ligamentous structures surrounding the joints. In the treatment of these injuries immobilization is the chief indication, combined with pressure and cold in the early stages and with heat and massage in the later stages. The most common joints affected are the acromioclavicular, the knee and the ankle. Less commonly involved are the shoulder joint, the elbow and the wrist. Sprain of the acromioclavicular joint is a very common and markedly disabling injury in football. This joint is the attachment of the shoulder girdle and the upper extremity to the clavicle, which is the only bony connection between the upper extremity and the trunk. The articulation is probably one of the shallowest in the body and its integrity is preserved by a rather frail capsular ligament but more especially by the stronger coracoclavicular ligament extending from the coracoid process to the under surface of the clavicle. Blows on the tip of the shoulder, such as in tackling or falling upon the ground, result in a tearing of this strong ligamentous structure, thus permitting an upward subluxation of the outer end of the clavicle. The pain experienced is often described as paralyzing the arm of the involved side. There is tenderness and swelling over the joint and any attempt to abduct the arm, such as in the act of throwing, is extremely painful. The X-ray does not give much aid in the diagnosis because the appearance of a space between the acromion and the outer end of the clavicle may be normal due to the presence of an articular cartilage of varying thickness. Only when pictures are made of the joints of both sides can any definite information be obtained. Immobilization of this joint for sufficient length of time plus the application of heat after the early stage has passed is the best form of treatment. In the milder degrees of the injury, elastic adhesive strapping applied over the upper portion of the arm, holding the arm to the chest, is often sufficient. Motion in the acromioclavicular joint is slight if abduction of the arm can be prevented. In the more extensive subluxations, a dressing must be applied to lift up on the upper extremity in addition to the above dressing. Such a dressing can be made from adhesive straps applied to the arm and pulled firmly upward arcross the shoulder in crisscrossing strips. An injury to the acromioclavicular joint frequently disables an athlete for an entire season, if sufficient time is not given to prevent recurrence of the injury. The tendency is for athletes to attempt to play when the discomfort in moving the arm decreases after one or two weeks. Almost invariably such players are disabled again because they receive another bump on the tip of the shoulder, which produces a recurrence of their previous symptoms. A period of four weeks rest is none too long for a firm healing of an acromioclavicular subluxation and even then the clavicle rarely is attached in its former position, although a functionally useful shoulder is almost invariably obtained.

The Knee Joint

In all forms of athletics, the knee joint is a particularly vulnerable articulation. This is especially true in football where tackling and blocking produce marked strains. Most blows on the knee are received from the outer side. With the foot fixed, the lower leg acts as a lever when a force is applied to the outer side of the knee. The internal lateral ligament is torn usually just above the internal semilunar cartilage. If the knee is further extended during the occurrence of the injury, the cartilage itself is often caught in a vice-like grip between the condyle of the femur and the head of the tibia, resulting in a longitudinal tear. Because the internal lateral ligament is really only a thickening of the inner portion of the joint capsule, the hemorrhage which occurs almost invariably produces a rapid effusion into the joint, so that the usual symptoms and findings are: Pain on the inner side of the

knee joint just above the head of the tibia, increase in lateral and rotary motions in the joint, and a rapidly developing joint effusion. The tear which is produced is usually transverse and in well-marked cases may occasionally be palpated. Since the ligamentous structure does not tend to retract, the torn ends may be approximated and adequate healing will take place if the joint is immobilized in extension. The most convenient immobilization dressing consists of a posterior plaster splint molded to the part while it is still moist, by a firm gauze or elastic bandage. A splint is preferable to a cast because it can be more easily adjusted as swelling decreases or atrophy takes place. It also permits aspiration of the joint effusion. This we have found to be a safe procedure if sterile precautions are taken and it is indicated to relieve the tension in the joint and prevent gradual stretching of the other ligamentous structures. After removing the bloody fluid from the joint, a firm elastic bandage of the ACE type should be applied around the knee and splint. Weight-bearing may be continued with the splint in place without too much disability. The splint may be removed at intervals of three to four days and careful passive motion and even diathermy and light massage given to the knee. The splint is reapplied between such treatments and after three or four weeks it may be discarded in favor of a supportive adhesive strapping applied with the knee in extention. It is most important in applying a strap to place strong diagonal layers across the inner side of the knee to support the torn ligament. The strongest strapping is applied with the web adhesive orthoplast which is anchored around the calf and thigh by circular turns of elastic adhesive. With this dressing, gradually-increasing limited motion of the knee is permitted. The period of disability must usually be as long as six weeks if an immediate recurrence of the injury is to be avoided. In minor degrees of this injury or in recurring injuries, supportive adhesive strappings often permit almost normal function without recurrence. The most secure supportive dressing is the hinged steel brace but this form of treatment is barred in football players. Diagonal adhesive strappings from above and below crossing on the inner side of the knee, applied with the knee in partial flextion, give good support and permit the wearer almost normal function.

In old injuries of the internal lateral ligament, where improper immobilization did not permit firm union of the torn ligaments and especially where the cartilage has been torn, the knee is particularly vulnerable. In such cases the knee may "go out from under" the player without any trauma if his body is twisted upon the knee when the foot is firmly fixed on the ground. Removal of the torn cartilage is the surest and quickest method of producing a stable joint and we have had many athletes play football, baseball and even run the hurdles after removal of the internal semilunar cartilage.

The Ankle Joint

Most sprains of the ankle joint result in tears of the ligaments at the outer side of the joint. The lateral ligaments are three in number, extending from the tip of the malleolus forward and backward to the talus and mesially to the calcaneum. There is one other ligament which is also sometimes involved, the talocalcaneal ligament, extending from the talus to the anterior portion of the calcaneum. Of these ligaments, the most frequently injured are the anterior talofibular, the talocalcaneal and the calcaneofibular. The symptoms of pain below and in front of the malleolus and rapid swelling are familiar. The identification of the torn ligaments is important because the dressing must be applied with the foot in the position which will relax the ligament or ligaments injured. Sprain may be differentiated from Pott's fracture by the fact that squeezing the fibula and tibia in the middle of the calf causes marked pain at the site of a fracture but little or no discomfort in the sprain of the ankle. The differentiation between a sprain and a sprained fracture is an academic one and has no practical bearing on the therapy. Early immobilization plus pressure is the most effective treatment. It is a fallacy to wait until the swelling goes down before applying a firm adhesive dressing. It is much better to apply a tight strapping before the swelling comes up. A strap should be put on with the foot slightly everted and at right angles to the leg. The basket-weave strapping has proved most effective; it can be more firmly applied if the part is first dry shaved. The adhesive strips should be placed on the inner side of the leg and ankle, beginning about six inches above the malleolus, and should be firmly pulled down under the foot and upward along the outer side of the leg. The tense adhesive strips will not always exactly fit the part, but if an assistant will hold the ends of the strips until the strapping is completed, the strips will not loosen and a firmer dressing may be obtained. The longitudinal strips are alternated with transverse ones started on the involved side and extending around the back of the ankle to the

opposite side. The transverse strips should not meet in the midline of the foot and ankle and if this precaution is taken the danger from subsequent swelling is largely removed. The strips should overlap at least half and those of the anterior part of the bandage should be brought forward over the dorsum of the foot and ankle. The transverse turns should be carried upward as far as the upper limit of the longitudinal strips. If the basket-weave strapping is applied soon after the injury, in spite of beginning swelling, and if the foot is elevated for twelve to twenty-four hours, the period of disability may be markedly shortened in most cases. After twenty-four hours, heat may be applied in the form of hot baths with the adhesive strapping in place. As a rule, the patient may be ambulatory with crutches and after a week or two may begin to resume normal function with the supportive strapping. The strapping should be renewed or reenforced as the swelling goes down and it becomes loose.

Not infrequently, after a sprained ankle, the patient may complain of pain and soreness in the calf muscles. This is usually due to a tear of the muscles of the calf which occurred at the time of the injury but which did not produce symptoms until function was resumed.

Summary

A thorough understanding of the surgical pathology of traumatic lesions to the soft tissues of the body makes for a more intelligent and more effective treatment. Appropriate early treatment is often able to reduce the period of disability. In most traumatic injuries, cold, elevation, pressure and immobilization are the most beneficial therapeutic measures in the early stages. In the later stages heat and massage are substituted for cold, and the other measures are varied according to the location and type of injury. The method of applying these therapeutic measures to the commoner athletic injuries has been described.

The Tuberculous Teacher a Real Danger to the Pupil

(*Continued from Page 550*)

percent respectively infected. It was found that approximately eleven per cent of seven thousand pupils tested in the schools of Southwestern Minnesota were infected with tuberculosis. Comparing this with the schools in which the pupils were exposed to the tuberculous teacher serve further to emphasize the danger.

Since the teacher is a source of danger to the pupil every precaution should be taken by the school boards to be sure teachers are free of tuberculosis before being given a contract. It would seem practical and well worthwhile if the board of education before issuing certificates should require all teachers to have the tuberculin test and be x-rayed if positive. This should be repeated each time the certificate is renewed. It would be fair both to the teacher and pupil. If such a requirement had been made of this teacher her case of tuberculosis would have been discovered several years earlier. Her recovery would have been more certain with less expenditures of time and money. Many children would have been prevented from being infected with tuberculosis. When every effort possible is exerted to shut off all sources of infection the deaths from tuberculosis will be greatly reduced. The teacher as a danger to the pupil can be removed by seeing that none are employed who might endanger their health. It is to be hoped that physicians, with their knowledge of the danger of tuberculosis, will bring this to the attention of school boards and parents and teachers associations. They will thus practice preventive medicine in a way that will return the greatest benefits.

Bilateral Urinary Lithiasis*

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BILATERAL renal lithiasis is relatively uncommon as statistics gathered from various sources give an average of its occurring in about 13 or 14 per cent of all cases of renal stone; six per cent of bilateral renal stones were reported by Thomas in 1921 in a study of 203 cases of urinary lithiasis in children.

The urologic problems involved have been treated with considerable space in the medical literature by many writers notably among whom were Geraghty 1921, Chetwood 1928, Hamer 1930, and Winsbury-White in 1934; Swift Joly devotes considerable space to this condition in his volume on urinary stone. Definite plans of surgical attack have been outlined by these men to apply to a variety of complications and emergencies which may arise during the management of a case of this type as well as to the choice of procedures to be followed. This discussion will outline these complications and emergencies and also describe the application of urologic surgical principles to the condition.

The clinician is not infrequently surprised to encounter a patient with large or branched bilarteral renal calculi of the "stagg horn" type who has very few if any symptoms and no pain. These individuals usually present themselves because of urinary infection or on occasion because of hematuria. When pain is a presenting symptom the side involved in the most recent attack may be generally regarded as the site of the better of the two kidneys. In many patients the renal functions are maintained almost entirely by the one organ. In this respect bilateral stone follows the laws of renal counterbalance in the same manner as do renal infections and hydronephrosis, and it also resembles other infectious processes in the kidneys wherein the neglect of some condition on one side predisposes to the involvement of the contralateral kidney.

In comparison with unilateral renal calculi which are frequently aseptic, bilateral calculi are almost invaribly septic, bilateral infection is the rule and the organisms found upon urine culture are the same on both sides. Likewise the chemical analysis of the removed calculi shows their chemical compositions to be identical, this is probably not true in all cases. In recurrent stone different organisms may be found from each kidney and the chemical composition also may be of a different type.

The extreme persistance of urinary infections is responsible for the high percentage of recurrances in bilateral stone taking place in from 10 to 35 per cent of all cases. This fact emphasizes the necessity for careful bacteriologic study in order that the patient may be placed on an adequate prophylactic regime after the removal of calculi.

Whenever calculous has been identified on one side of the urinary tract the possibility of the bilateral distribution of stone must always be kept in mind and a complete urologic investigation should be carried out. The employment of intravenous urographic methods gives valuable information as regards the distribution of stone as well as an estimate of the amount of parenchymal destruction and functional damage.

It is difficult to outline all surgical procedures which would include the various circumstances that may arise in the treatment of bilateral lithiasis as each patient must be considerad as an individual before the surgical attack is begun. When symptoms of obstruction or other emergencies were absent treatment in the past was directed at waiting for such emergencies to transpire or until an advanced degree of parenchymal damage and loss of function rendered nephrectomy necessary. Hinman states that delay should be only temporary and never permanent and that all infected bilateral calculi should be removed, although a single small infected stone in a calyx may be safely observed. In many far advanced cases where destruction is marked, nephrostomy either temporary or permanent is the only choice and one is sometimes surprised at the unexpected improvement resulting from its employment.

While it is generally understood that the initial surgical attack is to be directed at the better of the two kidneys in order that its function will be improved to the maximum before the opposite side is operated upon, there may be many exceptions to this dictum.

Patients having an acute pyonephrosis, peri-

*Read before the Minneapolis Clinical Club, April 12, 1934.

nephritic abscess, or complete ureteral obstruction require immediate intervention.

Where a large calculous is present on one side and a small one in the opposite renal pelvis these patients should undergo removal of the smaller stone first in order that the possibility of ureteral obstruction and anuria will be averted.

In patients having a renal calculous on one side and one in the ureter on the other—the ureteral stone is usually attacked first by manipulative means or by operation unless it is likely to be passed. In general all lower urinary tract stones are attacked first unless there are contraindications present.

The difficulties involved in the surgical removal of large calculi are in avoiding renal damage during their removal. By employing anterior, posterior or extended pyelotomy surprisingly large calculi may be removed with slight parenchymal injury. Nephrotomy should be avoided unless cortical scarring permits easy access, however by this procedure the possibility of persistant urinary fistulae is enhanced. The extensive nephrotomies as employed by Schwyzer, where the kidney is cut from pole to pole are avoided by most surgeons as the risk of post-operative hemorrhage is great.

One of the commonest causes of the recurrance of bilateral renal calculi is their incomplete removal at the time of operation. In avoiding this the employment of flouroscopic and X-ray examinations at the time of operation is a most valuable aid for it is the only manner in which one can eliminate the possibility of stone fragments remaining.

With the premise that renal stone is a symptom rather than a disease, the post-operative care of patients from whose kidneys calculi have been removed is one of the most important factors in the treatment of the condition as well as in the prevention of their recurrance. All factors leading to interference of urinary drainage should be corrected—this is usually done at the time of operation. The correction of abnormal metabolic conditions is of importance as it is known that some types of calculi are definitely the result of dietary or metabolic disturbances. Cultural bacteriologic studies are made in order that the urinary infection present may be controlled or eradicated. After this has been done and other foci of infection have been removed, periodic pelvic lavage is one of the best methods of producing negative urine cultures. The chemical analysis of each calculous removed is of assistance in accomplishing the prevention of their recurrance.

The two consoling facts in the treatment of bilateral lithiasis are that many patients live for many years in spite of their disease, and that a timely well planned and carefully executed plan of surgical intervention will relieve pain, minimize infection and gain several years of comparative comfort for the patients afflicted with this condition.

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The JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA, *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

North Dakota State Medical Association
South Dakota State Medical Association
The Hennepin County Medical Society
The Minnesota Academy of Medicine
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M. E. Herz, *Business Manager*
84 South Tenth Street, Minneapolis, Minnesota

W. L. Klein, 1851-1931

MINNEAPOLIS, MINN., SEPTEMBER 1, 1934

A COMMUNICATION

I wish to express my appreciation of the generous space you have alloted to our State Association, in the printing of our annual transactions through the JOURNAL-LANCET of date August 15, 1934. And it's not only for the space but also for the form and the accuracy in which the publishers have done most excellent work. The grouping into one issue of all of the transactions and the various reports adds to the value of the publication.

A. W. SKELSEY, M.D.,
Secretary.
North Dakota State Medical Association

THE PRESIDENT HONORS DOCTORS MAYO

Socrates said "Fame is the perfume of heroic deeds." As perfume is first recognized in the proximity of its emmanation, so the physicians of the agricultural northwest who were first to discover their outstanding qualities take pride in every additional honor accorded Doctors William J. and Charles H. Mayo.

On August 8th, we have the spectacle of the president of the United States arriving at Rochester, Minnesota, by special train and there joining national officers of the American Legion in paying honor to these distinguished members of our profession whom we were first to acclaim.

And so we say "May jealousy, grief, sorrow and disappointment fill the hearts of all who refuse to wish them well." A. E. H.

PROTECTION AGAINST TUBERCULOSIS

The recent work of Lemon and Feldman (Arch. Int. Med., March, 1934) is very valuable in our better understanding of tuberculosis. They have introduced intratracheally into the bodies of animals, particles of silica; into the bodies of others, tubercle bacilli. They found that the cellular response to the irritative influence of silica particles and tubercle bacilli is essentially the same, since both of them promote the formation of characteristic tubercles. Thus, there is not a specific reaction to tubercle bacilli when they first find lodgment in the animal tissues.

For a long time we assumed that it was immunity which resulted from the first infection with tubercle bacilli which kept us from falling ill. This opinion probably arose from the fact that large numbers of persons were found to have positive tuberculin reactions, indicating contamination with tubercle bacilli and only a small number of them were ill at any one time. We assumed that it was immunity which protected the remainder against the bacilli already present in their bodies. Apparently we overlooked the great natural protective mechanism of the human body against foreign material including tubercle bacilli. It would appear now that most of the credit should have been given to this mechanism, for obviously tubercle bacilli of first infection are attacked and usually encapsulated as other foreign bodies of the particulate type. It seems very probable that it is the work of this mechanism

which retains the tubercle bacilli in their capsules in the bodies of so many persons over such long periods of time, rather than immunity, which evidently plays little or no part in the control of the first infection type of disease.

The chief difference which Lemon and Feldman found is that there was no progression in the case of tubercles produced by silica, whereas in those produced by tubercle bacilli there was usually evidence of progression and destruction. Even though the human body through its natural defense mechanism is capable of encapsulating and thus controlling tubercle bacilli over a long period of time, there are two great dangers from every focus of the first infection type of tuberculosis; the first is that the tissues of the body become allergic or sensitive to tuberculo-protein. Thereafter when tubercle bacilli are lodged in them, they no longer react as to a foreign body of the particulate type. The reaction is now specific. This has been proved very conclusively by such experimental workers as Gardner, Long et al, Krause, Burke, and Lemon and Montgomery. It is this specific reaction and what follows that results in the clinical destructive type of tuberculosis. The second great danger from the first infection type of tuberculosis is that tubercle bacilli may be set free at any time and find lodgment on allergic tissue. Thus, when bacilli are set free from their capsules, either acute or chronic reinfection forms of disease may develop, depending upon whether they enter the subarachnoid space, the blood stream, the lung parenchyma, etc. Moreover, allergy of tissues makes it dangerous to the body when tubercle bacilli are admitted from exogenous sources, as through exposure to patients suffering from tuberculosis.

An old argument has been that the body must be well immunized through the development of the first infection type of tuberculosis, otherwise, much larger numbers of persons would fall ill and die of this disease. No communicable disease has ever destroyed 100 per cent of the persons exposed to it. In tuberculosis, however, it is a very significant fact that girls and boys who react positively to the tuberculin test are in much greater danger of falling ill from clinical tuberculosis before the age of twenty-one years is reached than those who react negatively to the test. This fact has been well established by careful observations of the same groups of children over periods of years. On the basis of what already has occurred in these groups, it is estimated that from 10 to 20 per cent of the children who react positively to the tuberculin test will not go through life without illness from clinical disease and a good many of them will die of tuberculosis. Thus, it is purely a matter of protecting the human body against tubercle bacilli which lead to the first infection type of tuberculosis, for once this form of disease develops, the body is at the mercy of the tubercle bacillus. The carrying out of the necessary preventive measures is not a dream; it is now within the realm of physical possibility.

J. A. M.

DR. HOLMES' INTEREST IN THE ST. CROIX VALLEY

The recent destruction by fire of The Sanatorium at Hudson, Wis., brings to mind some early history of that institution that may be of interest.

When it was founded in the late eighties by Dr. Irving D. Wiltrout, it was his ambitious desire to have Oliver Wendell Holmes present at the dedication exercises. Even though a personal visit to Boston was made, he could not persuade Dr. Holmes to make the trip, but he kindly consented to the use of his name. Letters of congratulation on the building progress and some dedicatory verses for its opening were written and it was called The Oliver Wendell Holmes Hospital. In one of his many interesting letters, all written in long hand, he expressed his faith in the good that such hospitals in small centers of population might do, citing the fact that two had been recently established in the vicinity of Boston.

In October, 1889, he presented to the institution a set of his own complete literary works with his book-plate and his autograph on the front page. These volumes are now the highly prized possession of the writer, to whom they were found to have been bequeathed at Dr. Wiltrout's death in March, 1932. The book-plate shows a spiral shaped nautilus shell on the seashore and above this are the words *Per ampliora ad altiora.*

The name of the institution was successively changed to The Holmes Sanitarium and later to The Sanatorium, under which name and changed spelling it functioned for many years.

Dr. Wiltrout was only 32 years old when the building was erected; verily youth and optimism go hand in hand. Dr. Holmes was 80, but at a reunion of his class about that time had he not offered this toast:

"A health to our future, a sigh for our past,
We love, we remember, we hope to the last,
And for all the base lies that the almanac hold,
While we've youth in our hearts we can never grow old."

A. E. H.

SOCIETIES

PROGRAM

NORTHERN MINNESOTA MEDICAL ASSOCIATION

SEPTEMBER 10-11, BRAINERD, MINNESOTA

Banquet

Toastmaster—Dr. R. E. Scammon, Dean of Medical Science, University of Minnesota, Minneapolis.
Address—"Minnesota Man," by A. E. Jenks, Professor of Anthropology, University of Minnesota.
President's Address—Dr. A. C. Baker, Fergus Falls.
Address—Dr. F. J. Savage, St. Paul, Past President of the Minnesota State Medical Association.

Addresses

1. Fractures: Diagnosis and Treatment in Rural Practice.
   Dr. H. H. Leibold, Parkers Prairie, Minn.
2. Endocrine Growth and Sex Deficiency.
   Dr. L. F. Hawkinson, Brainerd.
3. The Present Status of Dinitrophenol.
   Dr. Edgar T. Herrmann, St. Paul.
4. The Cost of Medical Liability Insurance.
   Dr. B. J. Branton, Willmar, Minn.
5. Malpractice. Dr. W. H. Hengstler, St. Paul.
6. Idiopathic Hypochromic Anemia.
   Dr. Samuel H. Boyer, Jr., Duluth.
7. The Diagnosis and Management of Anemia.
   Dr. J. B. Carey, Minneapolis.
8. Malignant Tumors Arising from Epithelioma of the Pharynx.
   Dr. W. T. Peyton, University of Minnesota.
9. The Treatment of Infertility Associated with Hypometabolism.
   Dr. C. A. McKinlay, University of Minnesota.
10. The Jaundiced Patient.
    Dr. O. J. Hagen, Moorhead, Minn.
11. Report on the Meeting of the American Heart Association. Dr. Robert L. Nelson, Duluth.
12. Osteitis Fibrosa Cystica.
    Dr. E. N. Peterson, Eveleth, Minn.
13. The Diagnosis and Treatment of the Various Types of Goitre.
    Dr. E. H. Rynearson, Mayo Clinic, Rochester.
14. Cerebral Arteriosclerosis.
    Dr. E. M. Hammes, St. Paul.
15. Recent Therapeutic Advances in Neurology.
    Dr. J. C. Michaels, Minneapolis.
16. Non-organic Causes of Fatigue.
    Dr. Norman Johnson, Minneapolis.
17. The Prevention of Complications of Prostate Resection. Dr. Gershom Thompson, Mayo Clinic, Rochester.
18. Recent Progress in Therapy of Heart Disease.
    Dr. Morris Nathanson, Minneapolis.
19. Urography with Special Reference to Differential Diagnosis in Kidney Conditions.
    Dr. Edward Bratrud, Thief River Falls, Minn.
20. Medical Emergencies in the Chest.
    Dr. F. J. Hirschboeck, Duluth.

FIFTH ANNUAL MEDICO-MILITARY SYMPOSIUM

THE MAYO CLINIC

ROCHESTER, MINN., OCT. 7-20, 1934

The 1934 Medico-Military Symposium for Medical Department Reserve Officers of the Army and Navy will be held at the Mayo Clinic, from October 7th to 20th, both dates inclusive.

This is the Fifth Annual Inactive Duty Training Course to be held at The Mayo Clinic and will follow the plan which has proven so satisfactory in past years; that is to say, the morning hours will be devoted to attending clinics on subjects selected by the student officers, and the afternoon and evening hours given over to work in Medico-Military subjects. The Medico-Military Program will be under the personal supervision of Colonel Kent Nelson, M.C., U. S. Army Corps Area Surgeon, Seventh Corps Area and Captain J. B. Mears, M.C., U. S. Navy, District Medical Officer, Ninth Naval District.

The staff and faculty of The Mayo Clinic have placed their unexcelled facilities at the service of their Government in the interest of preparedness and have extended an invitation to all the service to participate. The two weeks' excellent clinical post-graduate work must make a definite appeal to all who are interested in their profession and does not incur as great a loss of time for the private practicioner that normally pertains to post-graduate work along professional lines.

The general motif of the Medico-Military part of the Symposium will be "Public Health and its Relation to National Defense." The problems of administration in military service presents features not dealth with in private practice. In the great field of sanitation as applied to military service, the medical officer has a distinct specialty. This course offers valuable and interesting training for the medical officer in all the components of our national defense. A splendid program of a thoroughly practical nature has been carefully compiled and the speakers selected for their ability to present authoratively the subject assigned to him.

Application for this course of Inactive Duty Training should be made either to the Corps Area Surgeon, Seventh Corps Area, Omaha, Nebraska, or to the District Medical Officer, Ninth Naval District, Great Lakes, Illinois. Applications should state the character of the work the candidate desires to follow in the morning hours. All student officers are expected to attend and participate in the afternoon and evening sessions.

BOOK NOTICE

SURGERY OF A GENERAL PRACTICE, by Arthur E. Hertzler, M. D., and Victor E. Chesky, M. D. With 472 Illustrations. St. Louis. The C. V. Mosby Company, 1934. $10.00.

This book represents an effort to answer the question "What is Minor Surgery?" with a practical and scientific exposition of what minor surgery constitutes. It is, indeed, the new edition of what the authors formerly called their "Minor Surgery" and their inability to answer questions as to what that title actually included led to the change of name.

The work is well done. Those who have followed the writings of the senior author would expect to find in these pages a substantial foundation of practical pathology with a superstructure of well digested advice based on his ample experience and that is just what has occurred. The illustrations are well chosen and with a view to depicting the earlier stages of the lesions, in the expressed hope of aiding earlier diagnosis in curable conditions. The whole thing is a good example of compactness, plainly stated and without padding or repetition.

Not the least valuable feature of the book is the implied suggestion of increased opportunities within the field of general practice. In normal times the specialties have made great inroads on that domain, to the extent that its very existence has been threatened. Now it is different; the average person has very little money for medical service of any kind and the more his family physician can do for him, within safe limits, the better it is for both. This book offers many good suggestions along these lines.

It is a sane and temperate document throughout. For example, the judicial attitude of the authors toward transfusion, on page 32, is very timely and well-expressed. There is no evidence of any tendency to ride fads or take extreme views at any point. The general tone of the book is well exemplified in the concluding sentence of the preface:

"Those who shy at state medicine may serve the cause best by serving the patient efficiently, inexpensively and quickly. When the general practitioner cared for the ailing public, there was no complaint about the high cost of hospital care." GILBERT COTTAM.

NEWS ITEMS

Dr. N. H. Greeman, formerly in practice at Fairmount, N. D., is now located at Dowagiac, Mich.

Dr. W. J. Matousek, Gregory, S. D., is now located at Glendale, Calif., where he will continue his general practice.

Dr. A. Stolinsky, who has been in active practice at Sheldon during the past seven years, has moved his offices to Lisbon, N. D.

Dr. Roy F. Raiter, Cloquet, Minn., is spending three months in Vienna, Austria, where he will take a post-graduate course in surgery.

The Renville County Medical Society held their August meeting at Olivia, Minn., with Dr. A. A. Passer, Olivia, the principal speaker.

Dr. Edwin C. Trytten has opened offices for the practice of medicine and surgery at Albert Lea, Minn. The doctor is a graduate of Rush Medical School.

Dr. J. F. Quinn, Marion, has moved to Parkston, S. D., where he will continue in his general practice of medicine.

Dr. A. C. Dean, who has been associated with the Clinic at Hot Springs, S. D., has accepted a position on the staff of the Washington University at St. Louis, Mo.

The Minnesota Supreme Court has confirmed the verdict of $3,000 against the Williams Sanitarium at Hudson, Wis., for the death of Arthur Brase of Waseca, Minn.

Drs. J. E. Hetherington, Grand Forks; J. W. Bowen, Dickinson, and W. C. Fawcett, Starkweather, have been appointed members of the North Dakota State Medical Board.

The Nicollet-LeSueur County Medical Society held their annual picnic at Le Center, Minn., last month, with a large attendance and a fine program for both afternoon and evening.

Dr. Harry A. Oftel, who has practiced medicine for many years at Cambridge, Minn., was found dead in his offices recently. Dr. Oftel was a graduate of the old Hamline Medical University.

One hundred and twenty-five thousand dollars will be expended for the new Indian hospital to be located at Wagner, S. D., and work will be started at once for an early completion of the building.

Dr. Ralph M. Peters, 62 years of age, and who has been in active practice in Minneapolis for over 40 years, passed away on August 12, after a short illness. Dr. Peters was a graduate of Rush Medical College.

Dr. S. A. Slater, Worthington, Minn., of the editorial staff of THE JOURNAL-LANCET, was honored by being elected president of the Southern Minnesota Medical Association, at the annual meeting recently held at Mankato.

Two busy days have been arranged for members of the Northern Minnesota Medical Society when they gather at Brainerd, Monday, September 10, for their annual two-day session.

Dr. Percy Watson, a medical missionary known in North China as "the man with 10,000 friends," because of his 25-year battle against the bubonic plague in Shansi Province, was welcomed home recently at his old home in Northfield, Minn.

Dr. E. E. Benedict, who has been in active practice for over a quarter of a century, died at his Minneapolis home last month, following a heart attack. Dr. Benedict was 57 years of age, and a graduate of Johns Hopkins University.

Charging Dr. E. M. Stansbury, Virmillion, S. D., with being negligent, and refusing to call in outside doctors for consultation, one of his patients has started suit for $25,000 as the result of a recent illness, during which Dr. Stansbury was forced to amputate his left arm.

Twenty-four Winona county physicians have formed an association known as the Winona County Physicians' Credit Bureau. The bureau is compiling a credit list of all patients who have made no payments on accounts for six months. Emergency service to relief patients is not included.

The annual outing of the St. Louis County, Minn., Medical Association was held last month, and was featured by a golf tournament in the afternoon and banquet and dance in the evening. Dr. F. J. Savage, president of the Minnesota State Medical Association, delivered the principal address at the banquet.

Responding to a summons from the Cuban government, Dr. E. G. Rosenow, head of the bacteriology department of the Mayo Clinic, has gone by airplane with a large quantity of a special serum he has developed to assist the health authorities of Havana in fighting an epidemic of infantile paralysis.

Dr. Raymond B. Allen, formerly connected with the Northwest clinic at Minot, N. D., has been appointed associate dean in charge of graduate studies at Columbia University college of Physicians and Surgeons in New York City. Dr. Allen left Minot four years ago after being for two years connected with the Northwest clinic.

Dr. J. E. Stuart of Livingston has in his possession what is probably the first kit of surgical instruments ever brought to Montana. The kit consists of a leather pocket case containing a number of surgical knives, lances, probes, etc., and a caustic pencil which still holds the original stick of nitrate of silver that was used 70 or more years ago.

Plans are being made for the staging of the First Northwest Health and Beauty Show to be held at the Minneapolis Municipal Auditorium from October 1st to 6th in conjunction with the annual Northwest Radio and Electrical Show. The purpose of the health and beauty show is "To interest people in giving more thought to their health and thereby making life more enjoyable as well as increasing their span of life."

The annual meeting of the Southern Minnesota Medical Association, held at Mankato last month, was largely attended and a fine program carried out. The retiring president, Dr. M. C. Piper, presented a very interesting review of the association since its first annual meeting. New officers elected are: Dr. S. A. Slater, Worthington, president; Dr. C. W. Mayo, Rochester, first vice-president; Dr. J. C. Michael, Minneapolis, second vice-president, and Dr. H. C. Habein, Rochester, secretary.

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of September will be as follows: September 5, "Athlete's Heart"; September 12, "Encephalitis"; September 19, "Back in School"; September 26, "Progress in Cancer Control."

The Hennepin County Tuberculosis Society has established the Dr. John W. Bell Lectureship in tuberculosis in the Hennepin County Medical Society. Under this lectureship, an authority on tuberculosis will address members of the society at the December meeting, which this year will be December 3. Dr. Bell, who died in 1933, was a member of the House of Delegates of the American Medical Association from 1919 to 1923. He was emeritus professor of medicine and at one time professor of physical diagnosis and clinical medicine, University of Minnesota Medical School.

The eighteenth biennial convention of Phi Rho Sigma medical fraternity will be conducted in Minneapolis under the sponsorship of Theta Tau chapter of the University of Minnesota, September 9 to 13. This international organization of 43 chapters throughout the United States and Canada will bring outstanding men in the medical profession to Minneapolis. Some 250

state alumni are expected to attend. Officers of the organization are: Dr. Irving S. Cutter, dean of the Northwestern University medical school, president; Dr. Jonathan Forman, Columbus, Ohio, vice-president, and Dr. Ralph W. Elliot, Cleveland, Ohio, secretary. Dean E. P. Lyon, of the University of Minnesota, is honorary president of the convention.

The Border Medical Society, with more than 30 physicians and their wives, met at San Haven, N. D., on July 13. Several outstanding Canadian physicians were in attendance, including Dr. David A. Stewart, of the Sanatorium at Ninette, Manitoba; Dr. Wherrett, executive secretary of the National Canadian Tuberculosis Association, Ottawa, and others. The morning hours were devoted to a discussion and exhibition of X-ray therapy, with inspection of the fluoroscope and pneumonothorax facilities of the Sanatorium. In the afternoon, Dr. Stewart described the Manitoba system of tubercular control. He was followed by Dr. Mark of the State Sanatorium at Walker, who explained Minnesota's system of control. A committee will study both the Minnesota and Manitoba plans for report to the North Dakota State Medical Society, and it is hoped that the resultant new plan may be financed through the sale of Christmas seals.

CLASSIFIED ADVERTISEMENTS

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Good location for Scandinavian physician in Minnesota town of 400, large territory. Write to Box 1388, Fargo, N. D.

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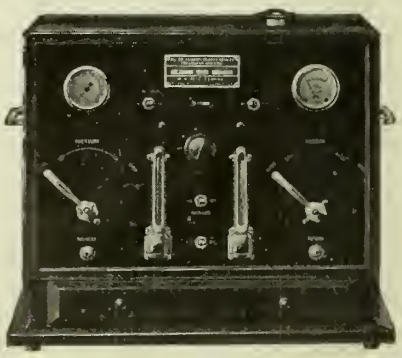
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Holden and Gurnee, Am. Jour. Obs. & Gyn., July, 1931.
Holden and Sovak, Am. Jour. Obs. & Gyn., Nov., 1932.
Counseller, Jour. A. M. A., Sept. 16, 1933.
Graham, Am. Jour. Surg., June, 1933.
Stone, Am. Jour. Physical Therapy, April, 1932.
Jacobs, St. Louis Med. Soc. Bulletin, Discussion by Vaughan and Gellhorn, June 5, 1931.

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The JOURNAL LANCET

Minneapolis, Minnesota
September 15, 1934

New Series
Vol. LIV, No. 18

The Therapeutic Value of the Intratracheal Use of Iodized Oil in Bronchial Asthma*

Ray M. Balyeat, M.D.
L. Everett Seyler, M.D.
Oklahoma City, Oklahoma

DURING the last decade, numerous articles have appeared concerning the diagnostic value of iodized oil in bronchography. A few articles have been written concerning the therapeutic value of iodized oil in bronchiectasis. Recently, Anderson[1] and Cole[2] have called our attention to the possible therapeutic value of iodized oil in bronchial asthma.

During the past few years, we have used a 40 per cent solution of iodized oil (lipiodol) intratracheally in a number of asthmatic patients, as a means of determining the presence or absence of bronchiectasis. In some of our cases, we noticed that apparently they were better from their asthmatic symptoms. Cole's work stimulated us to use iodized oil in a series of asthmatic cases, with an idea of determining, if possible, the type of asthma in which it is most indicated, the frequency with which the oil should be given, the relative value of various available iodized oils, the possible physicochemical mechanism of its action, and to determine the type of case in which it might be contraindicated. The series which we wish to report consists of 100 consecutive cases, all private except three, on whom careful study has been done from many angles, including, of course, sensitization study. In some of our patients the oil has been used only a few times, but in many it has been used over a period of from five to seven months. Three oils have been used; namely, lipiodol, lipoiodine and iodochlorol.

*Read before the North Dakota State Medical Association, Fargo, N. D., May 28, 1934.

*From the Allergy Department of the University of Oklahoma Medical School, and the Balyeat Hay Fever and Asthma Clinic, Oklahoma City, Oklahoma.

Technique

There are two methods of injecting iodized oil into the bronchial tree; namely, the transtracheal and the intratracheal. The transtracheal would probably never be indicated in asthma, and, therefore, only the second method mentioned will be described.

The exact method for given iodized oil intratracheally varies greatly in the hands of different operators. The method used by us is a combination of Cole's, Singer's[3] and the one use by Ochsner.[4]

Preparation of the Patient—Before attempting to introduce the iodized oil, Amberson[5] prepares most of his patients by giving them by mouth codeine sulphate, grain ½ to 1, or sodium amytal, grains 3, while in other cases he gives atropine sulphate, 1/100 of a grain. In many of his patients he advises postural drainage as a means of cleaning the bronchial tubes previous to introducing the oil. Practically all of his cases studied, however, were those of lung abscesses or of bronchiectasis. In many of the cases we have studied, there was no indication for postural drainage before giving the oil, as there was no history suggesting bronchiectasis. However, in those cases of asthma whose history suggested



Figure 1.—Position of the patient for filling the lower lobe of the bronchial tree with iodized oil.

bronchiectasis or who were raising large quantities of sputum, postural drainage was advised before the oil was introduced. In cases of bronchiectasis, whether it be the tubular form or the saccular form, this is the necessary procedure before the oil is used for the purpose of bronchography. In the use of the oil for the treatment purposes, previous postural drainage has not been done.

In the asthmatic, except for local anesthesia which is required in some cases, we feel that the only preparation necessary is to relieve the patient from his wheezing, if it should occur at the time the oil is to be given. This is best done by the use of adrenalin—in some cases, adrenalin and ⅛ grain of morphine. The patient is seated in a comfortable position where he can lean to the right or to the left and slightly forward, as would be indicated for filling various portions of the bronchial tree. In using the oil as a therapeutic agent for temporary relief in the uncomplicated asthmatic, in those with infected bronchial tubes or in those complicated with the tubular or saccular form of bronchiectasis, we have found it necessary usually to inject only the lower bronchial tree.

In nearly all cases of asthma in which the iodized oil was used, either for the purpose of bronchography or for therapeutic use, it was found necessary to use some form of local anesthesia the first two or three times the oil was given. After that, local anesthesia was dispensed with in about 80 per cent of all cases.

Without the use of a tongue depresser, the throat is sprayed with a 1½ per cent solution of cocaine hydrochloride, during which time the patient is advised to breathe more deeply than normal. The solution anesthetizes the pharynx and the trachea. The spray of cocaine on deep inspiration reaches the bifurcation of the trachea, thereby having a tendency to destroy the cough reflex. In many cases no other local anesthesia is used. In others we have found it necessary to use, besides the spray, the application of a 10 per cent solution of cocaine to the anterior pillars and to an area between the root of the tongue and the tonsillar area, which narcotizes the endings of the glossopharyngeal nerve. The local application to the two areas mentioned has a tendency to interrupt the swallowing reflex. In some cases the last procedure is essential, as has been frequently pointed out by Ochsner.[6] We have found that about 20 per cent of the cases in which the



Figure 3.—Syringe and cannula used for giving iodized oil.

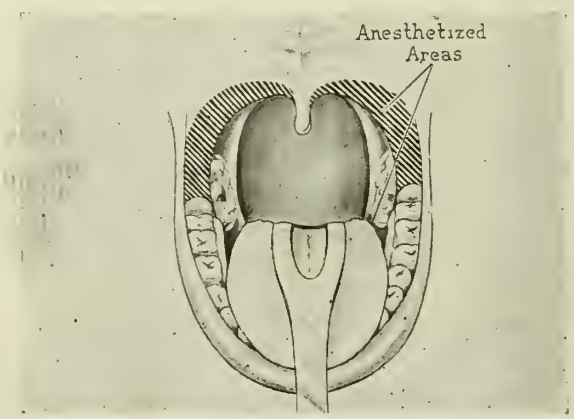


Figure 2.—Illustrating areas of the throat to which local anesthesia should be applied.

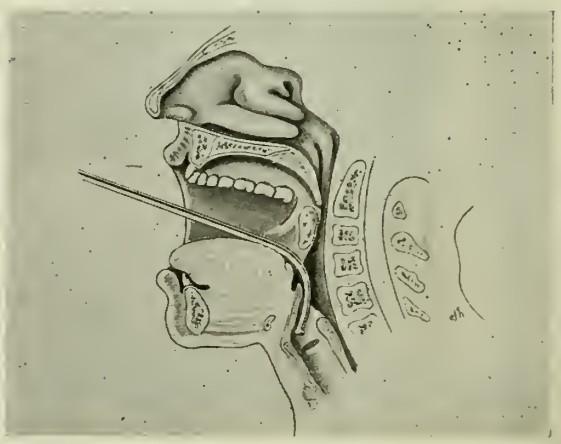


Figure 4.—Showing position of the cannula. Note the tip of the cannula is in the larynx.

10 per cent solution of cocaine was used complained the following day of considerable irritation of the throat.

In those cases requiring anesthesia, it is important to work rapidly. Our plan is to spray the throat until the patient has inhaled eight or ten times; then apply the 10 per cent cocaine to the anterior pillars and to the angle between the base of the pillars and the tongue; then to spray again, allowing the patient to breathe three or four times, and again coat the anterior pillars and the area at the angle of the tongue. The patient is placed in a forward position, either to the right or to the left, depending on the side of the bronchial tree to be injected, and the head is thrown slightly backward. With a 10 c.c. Luer-Lok syringe and a curved laryngeal cannula, the iodized oil is either dropped rapidly onto the back of the tongue or the cannula is placed into the larynx before the oil is given. One soon learns in the individual case which method works better. While the oil is actually being given, the patient is advised to breathe quietly but much more rapidly than normal. This prevents the tendency to swallow.

Some operators advise the use of a tongue depresser or that the tongue be held with a piece of gauze, but we have learned that if the patient is allowed to leave the tongue in as normal position as possible, the tendency to swallow is very much decreased. However, in an occasional case to pull the tongue forward is best.

As previously mentioned, in about 80 per cent of the cases after the oil has been given from one to three times no anesthesia is necessary, and the oil can either be given rapidly on the back part of the tongue or the cannula put into the larynx when the oil is injected. It is remarkable how patients learn to take the oil without anesthesia, without swallowing and without apparent discomfort. We feel that unless the operator is quite experienced with the work, it is very important that the cannula be placed into the larynx before the oil is given; otherwise, in spite of the excellent co-operation of the patient, the X-ray will show most of the oil in the stomach instead of the bronchial tree.

Iodized Preparations Used

In our study, we have used three preparations of iodized oil; namely, lipiodol, which contains about 40 per cent iodine; lipoiodine, which contains approximately 27 per cent iodine; and iodochlorol, which contains about 25 per cent iodine and 7 per cent chlorine. Lipiodol has as its base poppy seed oil; lipoiodine has sesame oil; and iodochlorol has peanut oil as a base. In most of our cases, lipiodol or lipoiodine has been used.

It has been our experience, and likewise that of others, that iodized oils are much more easily given and have a tendency to cause less coughing if they are warmed to about 110° F. The viscosity of lipiodol is so great that it is difficult to handle unless it is warmed. It is true that the tendency for it and the other oils to enter the alveoli is much greater when they are warmed, but we feel it does no harm in the asthmatic. In case of bronchography, to use the oil unwarmed is preferable, as it will give a better outline of the bronchi. The viscosity being greater, it will adhere to the bronchial wall. Lipoiodine, of necessity, must be warmed, as the crystalline substance, Ethyl-Diiodo-Brassidate, should be thoroughly in solution before the oil is given.

For bronchography, we have used almost routinely the 40 per cent oil (lipiodol), as for this purpose it is certainly superior to the 25 per cent and the 27 per cent oils. For treatment purposes, we have used the 27 per cent oil (lipoiodine) more often than lipiodol. It appears that as a therapeutic agent for temporary relief from asthma, the moderately heavy oil gives as good results as the heavier oil. The use of iodochlorol for bronchography is quite satisfactory. Some patients have objected to a peculiar taste that it



Figure 5.—Showing the relative value of a heavy and a light iodized oil in bronchography. Note the distinctness of the bronchial tree on the left; it was filled with a 40 per cent oil. The right was filled with a 27 per cent oil.



Figure 6.—Plate showing a combination of a tubular and saccular form of bronchiectasis in an asthmatic patient of ten years' standing.

has, and many to whom we have given this oil has, and many to whom we have given this oil for therapeutic purposes have objected to its taste.



Figure 7.—Showing the tubular form of bronchiectasis in an asthmatic of twenty years' standing.

Part of the Bronchial Tree Injected

Bronchiectasis is not an uncommon complication in true asthma. Of the 100 consecutive cases we have studied with bronchography, twenty-eight showed definite evidence of either the saccular form, the tubular form or a combination. Most of the evidence of bronchiectasis in asthmatic patients occurs in the lower bronchial tree. Therefore, in the use of iodized oil for therapeutic purposes, in practically all cases only the lower bronchial tree need be injected.



Figure 8.—Showing oil remaining in the bronchiectatic sacs eight weeks after it was given.

Treatment Interval

In the use of iodized oil, we have established the following routine:

Before treatment is instituted, the iodized oil is chiefly used for diagnostic purposes as a means of determining the presence or absence of bronchiectasis. One side is injected with 20 c.c. of the oil and a plate is taken, and the next day the other side is injected with the same amount. Then, if treatment is instituted, 10 c.c. of the oil are given on each side about four days later, and the oil is given once a week from that time on. In establishing this routine, we have tried using the oil at various intervals, and it appears that a weekly interval is sufficient. After the oil has been given for a number of times, this interval can be increased to a two-week interval, three-week interval, four-week interval or longer. More details concerning the use of the oil will be found in the cases which will follow.

Case Reports Illustrating Various Types and Ages of Asthmatic Patients in Which Iodized Oil Has Been Used for Therapeutic Purposes

Most asthmatic patients to whom we have given iodized oil as a diagnostic or therapeutic measure have been the so-called intractable asthma cases, and in many of the patients, poor results have been obtained by the usual methods of treatment. We have frequently used it in those cases on whom all drugs or other measures used for temporary relief have worn out.

An Early Case of Asthma Without Complications

Case 1—F. W., male, aged 22 years, had suffered from seasonal hay fever for five years, with asthma for a period of one year. He was first seen by us seven months ago. He was found markedly sensitive to food, animal dander and pollen. At the time we saw him, he was using adrenalin five or six times daily. He was raising enormous quantities of white glairy mucus. He was placed on the usual method of treatment; namely, elimination of the substances that could be eliminated, and desensitization against pollen.

Difficulty was obtained in giving him temporary relief, as adrenalin had practically worn out. It would give him some relief, but would require six to ten doses daily. We tried various other methods used for temporary relief, without success. Bronchography by the use of lipiodol showed no evidence of bronchiectasis. After bronchography was done by the use of lipiodol, then lipiodol was given, 5 c.c. on one side and 5 c.c. on the other, at weekly intervals. After the fourth dose, the patient became symptom-free and has remained so since. After eight doses were given, then he was advised to come only every two weeks, and he came at that interval for a number of times, at which time it was changed to a three-week interval. This is the interval on which he is being held at the present time.

Case of Asthma Without Previous Treatment

Case 2—F. M. T., female, aged 48 years, complained of hay fever and asthma for three years. This patient had been suffering rather severely but had used nothing for temporary relief. Without giving her any of the usual preparations for obtaining temporary relief, we advised the use of iodized oil, and lipoiodine was used. Ten c.c. were given intratracheally on the right side, and the second day 10 c.c. were put on the left, and thereafter 10 c.c. were put on the left at one sitting and on the right at the second sitting, but at weekly intervals. The patient had been suffering rather severely with asthma, and after the third injection—in other words, after each side had been injected twice—the patient became comparatively free and has remained so since. She has had now her tenth injection, and we shall soon advise her to come only once a month.

We are trying this patient out to see what can be done by the use of the oil only, without suggesting any other line of treatment. She runs a small rooming house, doing her own work, which naturally brings her in contact with massive doses of dust. She was thoroughly worked out in the beginning and found sensitive to animal dander and to pollen. She comes from an allergic family, and, without any question, the primary factor in her asthma is sensitization. We do not feel that the oil is corrective, by any means. For that reason, we are now starting desensitization with pollen and the animal dander.

Asthma Complicated with Emphysema and Bronchiectasis

Case 3—D. H., male, aged 32 years, had suffered from asthma since three years of age. During his early life and his teens his attacks of asthma were very severe, and during this time he developed rather marked deformity of the chest. On our investigation, we found him sensitive to food, animal dander and pollen. There was evidence of rather marked emphysema. Desensitization was done over a period of a year, and the usual means for temporary relief were used. At no time, however, could he do without the daily



Figure 9.—Note barrel-shaped chest and the bronchiectatic area on the left filled with oil.

use of adrenalin or ephedrine. He was raising a large amount of white glairy mucus. With the slightest cold, he would have severe attacks requiring much adrenalin.

Lipiodol was started, and he has now had fourteen doses at weekly intervals. Ten c.c. on each side were given for the first three doses, and after that 5 c.c. on each side were given. For the last four months he has used one to two ephedrine capsules a week and is raising practically no mucus.

Asthma Complicated with Bronchiectasis

Case 4—A. Y., female, aged 48 years, was first seen in 1926, at which time she complained of hay fever and asthma for one year. She was cared for at that time by desensitization with pollen, and she did fairly well. Three years ago, however, during the fall of the year, she took a severe cold and developed apparently a bronchial pneumonia, ran high temperature for awhile, and following this, asthma was very severe. She was not under treatment at this time. Her asthma continued to be severe, and two years ago she developed pneumonia and ran a high temperature for several days. At this time, she raised a lot of bloody sputum. Following this, her asthma was very severe, and we have had her under constant care. A short chain streptococcus was isolated from the sputum. A vaccine was made, and desensitization was done with the pollen to which she is sensitive, and she was also given the vaccine. Much difficulty was encountered by the use of the vaccine, as such severe reactions were produced, locally and systematically, that it had to be discontinued. She continued to have violent attacks of asthma in spite of everything that was done. Various means of temporary relief were tried. One hundred and fifty milligrams of ephedrine and amytal were taken daily for weeks, as they gave some relief.

Lipoiodine was first started eight weeks ago and has been given at weekly intervals since, 5 c.c. on each side at a dose, with a result that the last three weeks she has reported that only one or two capsules a week were taken and that she is raising practically no mucus and has a general feeling of well-being.

Asthma Complicated with a Chronic Infection of the Antra and Sinuses

Case 5—A. L., male, aged 61 years, complained of asthma and infected sinuses and antra for five years. He gave a history of eczema during early life, but he had no symptoms of asthma until he went to Chicago on a business trip and developed a nasal infection which involved the antra and in a few days the chest. Since that time he has had attacks of asthma from time to time, and the last two or three years he has been a semi-invalid. He was sensitive to animal dander, food and dust. We cared for him for a number of months without much relief. This was a business man, and he was needed badly in his work, and we frequently talked about his condition and said that he was the type that was complicated with a chronic infection of the antra and sinuses and probably we would be able to do little for him. Bronchography showed a cylindrical form of bronchiectasis.

Lipiodol was instituted as a therapeutic measure six months ago and was given for six times weekly, and since then we have been giving it only once a month, with the result that he is using no adrenalin, has raised very little mucus and is attending to his work.

Asthma Complicated with an Acute Infection of the Bronchial Tubes

Case 6—F. H. B., female, aged 38 years, had never suffered from asthma until last August, at which time she developed what she thought was an acute cold, but she had no temperature. Very soon this nasal cold was accompanied with a cough and slight wheezing which continued until December. At this time, she developed wheezing and raised enormous quantities of a greenish-yellow type of sputum. She was brought to us, accompanied by a nurse, and was having about as severe asthma as we have ever seen. Her asthmatic symptoms were accompanied with asthenia. From the sputum we obtained a short chain streptococcus.

We were anxious to see what the iodized oil would do in subacute infections of the bronchial tubes, and it was given twice weekly. After the third week, she raised very little mucus. Her asthma quieted down, and she was returned home with her chest practically free from mucus. For two and one-half months, she has been practically free from asthma.

The Use of Iodized Oil in a Child Twelve Years of Age

Case 7—A. S., female, aged 12 years, developed asthma at one year of age. For the last few years her asthma has been severe enough to interfere seriously with her school work. Physical examination revealed evidence of marked emphysema, and bronchography revealed evidence of the cylindrical type of bronchiectasis. Sensitization tests showed reactions to many pollens, animal danders and foods. She has been under our care for a period of three years. Results of treatment had not been very satisfactory.

Iodized oil was instituted, giving it at weekly intervals, with the result that she obtained relief from her symptoms.

We have used iodized oil in a number of children from ten to fourteen years of age, and we have found that children will soon learn, after the first few doses, to co-operate beautifullly so the oil can be introduced into the bronchial tubes without difficulty.

The Use of Iodized Oil in a Woman Aged Seventy-four

Case 8—Mrs. E. J. T., aged 74 years, had suffered from asthma since she was a small child. When first seen by us, she weighed 78 pounds. She was having violent attacks of asthma, and she was trained to use adrenalin, which she did with some relief but had to use it often. She was very weak, but the heart was apparently normal.

In spite of her weakness, lipoiodine was given, 5 c.c. on each side every fifth day. After the third or fourth dose, her asthmatic attacks quieted down, and she now suffers only from a chronic cough.

This case is reported only to show the possibility of the use of iodized oil in the aged, on whom frequently poor results in the treatment of asthma are obtained.

Comment

The cases just reported, except one, are all of the so-called intractable type, and all except two were cases whom we had treated for a number of months to a number of years, without obtaining what we would consider good results.

The first case reported was a young man on whom the usual methods of temporary relief had failed, and the oil relieved him of asthma. Case 3 had marked emphysema and bronchiectasis, yet the oil gave temporary relief. Case 4 was one of bronchiectasis of a moderate degree but had asthma very severely, and who was using large quantities of ephedrine with only partial relief. The oil has given temporary relief that is well worth while. The sixth case reported was one of very severe infection superimposed on true asthma. The seventh and eighth cases illustrate the value of the oil in temporary relief of asthma in children and adults. The cases reported illustrate many others we have studied, in which the oil has given temporary relief after all other measures have failed.

Possible Physicochemical Mechanism

The few who have used iodized oil as a therapeutic agent have said practically nothing concerning the possible mechanism of its action. The temporary relief given the majority of the uncomplicated cases of asthma and a large per cent of those complicated with bronchiectasis has interested us very much in the possible physicochemical mechanism with which it works. It appears from a mechanical standpoint that the oil probably acts (1) as a lubricating agent in the small bronchioles, thereby preventing the formation of plugs; (2) by coating over the mucous membrane of the bronchial tree, thereby protecting it from the irritating substances to which the membrane is specifically sensitive; (3) coating over the mucous membrane would also protect it in a mechanical way from fine dust and lint to which the membrane is not hypersentitive, in a similar way as a bland oil would on a burn: (4) in those cases in which there is a superimposed bacterial infection, or in those complicated with bronchiectasis, the oil apparently replaces the infectious material and allows the patient to cough up the purulent material, thereby preventing absorption of toxins; (5) while the oil is not a bactericidal agent, it has been shown by Ochsner[4] that there is considerable reduction of the bacterial content of the sputum of those in whom it is used.

In studying the action of the oil, we soon thought of the five possibilities mentioned above which had been thought of and considered important by Cole,[7] Ochsner[6] and Singer.[3] Ochsner,[6] in his study of bronchiectasis, has tried the use of the bland oil without the iodine, without relief. It appears that there is a possible action other than the five mentioned.

Experimental Work In Trying to Determine Additional Factors

Taking into consideration the histology and the physiology of the lining of the bronchial tubes, and finding iodine in the urine a few minutes after giving the iodized oil, we felt that the following chemical action was taking place:

The iodine radical which is joined to the lipoid substance would break off as the oil came in contact with the air and the mucous membrane, and the iodine radical would immediately join the sodium radical of the sodium chloride from the secretions from the bronchial tubes, and, therefore, being in close contact with the goblet cell, the sodium iodide would be absorbed by the cell. In other words, this would stop the abnormal secretion of white glairy mucus with which so many asthmatics have to contend.

We found in dealing with patients that in fifteen to twenty minutes after giving the iodized oil the iodine could be found in the urine, and in an hour it would be much greater. At the end

of three hours, large quantities of iodine could be found in the urine, and it would continue to be found for a period of four or five days. Therefore, we felt quite sure that it was absorbed through the bronchial mucous membrane. In giving the oil, we were careful that the cannula was placed in the larynx and that the patient did not swallow, and we knew that the oil went into the bronchial tree, beacuse in a large per cent of the cases the stomach and the bronchial tubes were X-rayed and no oil was found in the stomach.

To try to prove the theory just suggested, we anesthetized a dog; the larynx and part of the trachea were disected and brought forth, and there were injected 7 c.c. of lipiodol on each side. The dog was held under anesthesia over a period of two hours and fifteen minutes, and all specimens of urine were collected; no iodine was found. In another dog we followed the same procedure; however, we put in lipoiodine—10 c.c. in each side— and the urine was collected from cannulas placed in the ureters. No evidence of iodine was found in the urine. The dog was held under anesthesia four and one-half hours. Therefore, we must conclude that the iodine from the iodized oil does not pass through the bronchial mucous membrane.

Considering the above experimental work, we must conclude that the only way the iodine is taken into the blood stream and thereby found in the urine is as follows:

As soon as it is put into the bronchial tubes, the ciliated action of the cells and the cough reflex quickly bring it up into the salvia and is swallowed, and it is absorbed through the gastrointestinal tract. Our theory concerning the possibility of changing the polarity of the goblet cell then must be forgotten. We believe, however, there must be some chemical action. Possibly in some way the iodized oil acts as a mild astringent on the goblet cell.

One other way in which the iodized oil may give the uncomplicated or the case of asthma complicated with bronchiectasis temporary relief is by virtue of its weight. The iodized oil being very heavy due to the iodine, remains in the bronchial tubes from one to several days. We have no way of proving it, but in all probability a bland oil does not remain in the bronchial tubes more than a few hours. The difference in weight between the bland oil and the iodized oil may be an explanation for the lack of relief when the bland oil only is used and the relief obtained upon use of the iodized oil.

Contraindications

Ochsner,[4] Cole[2] and Amberson[5] have suggested certain contraindications, and, without question, there are contraindications to the use of iodized oil. They have pointed out that it should be used with care in certain cases of malignancy, acute bronchiectasis and acute abscesses, as there is danger of extension of the infectious process in other portions of the lung. It is considered by all who have worked with it that it is contraindicated in cases of active tuberculosis. We see but few cases of asthma complicated with active tuberculosis, and it is unusual to find true asthmatics with lung abscesses. Consequently, in the cases of asthma we have seen, we feel there have been none in which the oil has been contraindicated.

In the 100 cases of asthma we have studied, we have given the oil in some only a few times but in others many. All told, the oil has been given over 700 times. In no case has there been evidence of iodism; however, practically all cases had previously used iodides. Some patients, especially those with bronchiectasis, had had considerable coughing following its use, especially the first few times it was used. Asthmatic patients are so accustomed to irritation of the bronchial tree that they tolerate any foreign substance with ease; for example, they take anesthesias much better than the average individual, and, therefore, they should tolerate iodized oil well, and apparently they do.

We feel that every asthmatic should be tested with peanut oil, poppy seed oil, sesame seed oil, corn oil, etc., as a means of ruling out hypersensitiveness to these substances, as these are the oils that are used for bases for the iodized oils. Certainly it would be unwise to use iodochlorol in a patient sensitive to peanut oil, lipiodol in one sensitive to poppy seed oil, or lipoiodine in one sensitive to sesame seed oil, and so on.

Results of Treatment

Of the 100 asthmatic sufferers to whom iodized oil has been given as a therapeutic agent, about 50 per cent have been treated from three to seven months. In the treatment of this group, the oil has been given, all told, 627 times, without any untoward symptoms except for moderately violent coughing in some cases. In another group under study, we have encountered once, iodism, which manifested itself by marked increase in nasal secretion, aching of the teeth and the region of the parotid gland and aching of the joints. As previously stated, the patients making up the

group we are reporting were nearly all of the intractable type.

We have classified our results as follows:

Excellent results..... .....11 per cent
Good results.....59 per cent
Definitely improved.....13 per cent
Slightly improved.....12 per cent
Very slight or no improvement..... 5 per cent

Those obtaining excellent results were cases who received practically 100 per cent relief from symptoms. In some of them, results were obtained after the oil had been given only a few times. None of these cases showed evidence of bronchiectasis.

By "good results" we refer to those cases who obtained from 50 to 80 per cent relief from their symptoms. Some of these cases showed evidence of from considerable to marked bronchiectasis.

Those referred to as "definitely improved" were patients who obtained from 30 to 50 per cent relief. Many of these were patients with bronchiectasis.

In the 12 per cent marked "slightly improved," many of them had had their oil only a few times.

Of the five per cent showing very slight or no improvement, two of them had had the oil only three times and the other three were cases of bronchiectasis who had had oil less than six times.

Of the 100 cases studied, bronchography revealed definite evidence of bronchiectasis in twenty-eight. One of the outstanding signs of improvement in the cases of bronchiectasis was their tendency to gain weight and general muscle tone.

Conclusions

1. Technique is important. Unless the oil is injected into the bronchial tree instead of being swallowed by the patient, good results cannot be expected.

2. After giving the oil the first two or three times to a patient, it is unusual to find one who cannot take it without the use of local anesthesia.

3. For use in bronchography, iodized oil with a 40 per cent iodine content is superior to one with a 25 per cent. For therapeutic purposes, the heavier oil appears to be better in cases with bronchiectasis, but the lighter oil is just as good in the uncomplicated asthmatic.

4. Contraindications to the use of the oil should always be considered. The average asthmatic patient tolerates the oil well, and we believe there is little danger from its use.

5. The best treatment interval is from four to seven days.

6. For therapeutic purposes, the oil may be used in children under ten and in the aged.

7. The beneficial effect of the oil is chiefly mechanical, but it may act as a septic agent on the goblet cell, and it also has some bactericidal action.

8. Experimental work proves that the oil is not absorbed through the bronchial wall.

9. As a therapeutic agent for temporary relief from asthmatic patients in the intractable asthma, the oil is superior to any one individual means we have ever used, and, therefore, consider it a very valuable addition to the therapeutic armamentarium of the treatment of asthma.

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Bronchopulmonary Fuso-spirochaetosis With a Note on Treatment With Small Doses of Neosalvarsan*

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THE interest in the study of fuso-spirochaetal disease of the bronchi and lungs dates back to the early recognition of this pathologic condition by Castellani.[1] Despite the fact that Leyden and Jaffe[2] in 1867 and Rona[3] in 1905 demonstrated spirochaetes in pulmonary lesions, the potential pathogenicity of these organisms and their causal relationship in the production of broncho-pulmonary pathology remained unrecognized until Castellani's description of the disease in Ceylon, India, in 1906. The disease was first considered a tropical disease, and it was not until Violle[4] in 1918 recognized the condition in the civilian population of France that a world-wide search for this disease followed. Credit for the first recognition of this disease in this country is due Johnson[5] of Mississippi in 1909 and for pioneer work in the study of this subject to Pilot and Davis,[6] Kline,[7] and Smith.[8]

To begin with, it should be remembered that bacteriological and clinical studies indicate that the fusiform bacilli and spirochaetes are normally found in the buccal cavity about the teeth, tonsils, adenoids, and sinuses, as pointed out by Davis[9] and Pilot, Carpenter[10] and others.

That the buccal anaerobes may produce serious disease was called to our attention by Plaut[11] in 1894 and Vincent[12] in 1896 when they pointed out the relationship of these organisms to Vincent's Angina. Since that time the anaerobes have been considered by some authors as either primary or secondary causative agents in noma, ulcerative gingivitis, pyorrhoea alveolaris, certain forms of sinusitis, otitis media, mastoiditis, cervical adenitis, cerebral lesions, osteomyelitis of cranial bones and maxilla, infectious mononucleosis, gangrenous balanitis, pharyngomycosis, puerperal fever, gangrenous appendicitis, necrosis of intestinal tract and many other conditions. Because of this clinical evidence it is logical to conceive that the mouth anaerobes can, under certain conditions, become pathogenic and, when aspirated into the lungs in sufficient number may either be the sole agents or the contributors to the pathogenicity of such lesions as pulmonary abscess, pulmonary gangrene, suppurative pneumonitis, primary bronchiectasis and putrid and bloody bronchitis.

That aspiration of oral contents into the lungs can easily take place has been demonstrated in animal experiments by Kline,[7] Smith,[8] Crowe and Scarff,[13] Allen,[14] Hedblom, Joannides and Rosenthal,[15] Harkavy,[16] Schlueter and Weidlein,[17] Bethune,[18] and clinically by Myerson,[19] Daily and Daily,[20] Iglauer[21] and Ochsner.[22]

The pathologic lesions produced by these organisms vary from a simple putrid bronchitis to a diffuse gangrene. In all forms of the disease the tendency to necrosis and the production of a foul smelling lesion containing spirochaetes, fusiform bacilli, vibrios, cocci and other anaerobes are the striking characteristics. The lesion when fully developed is a ragged, ulcerated, foul smelling area, and is either brownish, grayish, or greenish in appearance.

It is obvious that a disease with such variable pathology will produce a multiplicity of symptoms varying in intensity form those seen in acute and chronic bronchitis to those of severe gangrene. The onset may not be unlike that of influenza. The patient is apt to complain of a coryza, chill or chilly sensation, achy feeling all over the body, general malaise, and prostration. In cases where the pulmonary involvement is extensive, the symptoms may simulate those of a pneumonia or acute tuberculosis. At times the clinical picture is either that of an acute lung abscess or massive gangrene. In these two conditions the patient seems most toxic. The fever is septic in character and on occasions reaches 104 or 105. Pulse may be very rapid and respirations labored. Severe hemorrhages may occur. A leucocytosis varying in extent with the severity of the process is usually seen. A shifting to the left of the neutrophilic leucocytes ac-

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cording to the modified Arneth and Schilling methods is especially marked in the acute cases. The sedimentation rate is increased. Frequently, in the chronic forms, the symptoms resemble those of a chronic tuberculosis. Generally it may be stated that foul sputum and bloody expectoration are the characteristic symptoms of the disease. The patient may recover spontaneously or develop complications such as fuso-spirochaetal empyema, pericarditis with effusion, cerebral abscesses, meningitis, and other less common conditions.

The physical observations will depend on the type and location of the lesions present. The former may be negative in acute or chronic bronchitis. It is not unusual to find signs of an acute broncho or lobar pneumonia or evidence of cavitation if cavity is large enough or peripherally placed. In many cases dulness on percussion and diminution of breath sounds are the only physical findings.

The symptoms and the physical observations are not diagnostic of the condition. The history of a previous sore throat, or operation on the upper respiratory tract under local or general anaesthesia, may lead to the investigation of possible aspiration of infected material from the throat, tonsils or sinuses. The roentgenograms may be negative or may show areas of infiltrations, consolidation , or cavitation, not unlike those seen in tuberculosis, or lung abscess. The diagnosis of bronchopulmonary fuso-spirochaetosis can only be made after a careful microscopic search for anaerobic organisms in the washed sputum. For this purpose the simplest stain is a five per cent to ten per cent of a fresh aqueus solution of carbolfuchsin. Methylene blue or gentian violet stain may be used. The Fontanna stain is best for spirochaetes. Dark field illumination will reveal the spirochaetes and vibrios to be actively motile. It should be remembered that absence of the spirochaetes for the sputum does not eliminate the possibility of fuso-spirochaetosis, just as a negative sputum for tubercle bacilli does not rule out tuberculosis. Cases have been reported where the sputum was repeatedly negative for spirochaetes or fusiform bacilli, and at operation or autopsy numerous anaerobic organisms were isolated from the lungs. Animal inoculation of patient's sputum may be of additional aid.

The disease is at times mistaken for pneumonia, tuberculosis, mycotic infections or cancer of the lung.

Treatment

Perhaps no phase of the study of lung suppuration is more fascinating than a review of the changing ideas as to the causative organisms responsible for the production of suppurative processes of the bronchi and lungs. A perusal of the early literature on the subject reveals few studies of the bacterial flora of pulmonary suppuration. Although Veillon and Zubor[23] in 1898 and Rona[3] in 1905 called attention to the role played by certain anaerobic organisms in the production of gangrene, the study of the bacterial flora of suppuration of the lungs was generally neglected and their findings completely ignored. This lack of definite knowledge as to the nature of the causative organisms of suppuration of the lungs was possibly responsible for the fact that medical treatment and particularly drug treatment was until recently generally unpopular and surgical treatment considered the desired treatment. It was not until Hartwell,[24] Lambert and Miller,[25] Ermatinger,[26] Bucher,[27] Varney,[28] and Smith,[29] made convincing studies of the bacterial flora of pulmonary suppuration that a renewed interest was awakened in the possibilities of medical treatment in general and drug treatment in particular. Smith was able to isolate pure cultures of spirochaeta microdentium, spirochaeta macrodentium, two strains of fusiform bacilli and four strains of vibrios from the sputum of patients suffering from gangrene. The studies of Klein and Smith are especially responsible for the serious consideration now being given the arsenicals in the treatment of suppuration of the lungs of fuso-spirochaetal etiology.

It has for some time been the belief of the writer[30] that the arsenicals, when used in large doses, are capable of doing a great deal of damage. The writer has in recent publications[31], [32] pointed out that no definite systematic studies have been reported on the action of the arsenicals in regard to dosage, frequency of administration and possible dangerous reactions in connection with its use in the treatment of suppurative lesions of the lungs. It is amazing to find that many authorities on the subject of suppuration of the lungs merely speak of the therapeutic use of the drug without qualifying the dose; others content themselves with the statement that the dosages used are the same as in syphilis; while still others advocate the use of the drug in intensive doses.[33]

Several pointed occasions in the past have

forced the writer to question the wisdom of administering the traditional intensive doses in the treatment of fuso-spirochaetal disease. It is for this reason that the administration of small doses is less dangerous and more beneficial in the treatment of this disease. Following the administration of large doses of neosalvarsan, the author has observed the sputum becoming more copious and bloody, the temperature rising to a higher level, the dyspnea increasing and the patient in general becoming more toxic. On the other hand, he has seen improvement with small doses.

The reason for this action of neosalvarsan is not definitely known. Indirect proof against large doses is the fact that clinical studies on the effect of intensive doses of neosalvarsan on the course of other febrile and toxic lung conditions reveal suggestive evidence against large doses. For instance, it is generally known that treatment of syphilis complicated by active tuberculosis with large doses of the arsenicals is only rarely followed by improvement. On the contrary, the patients are usually made worse. Writers[34] on this subject have frequently emphasized this point. Further indirect proof in this direction is the fact that syphilologists and dermatologists[35] rarely administer salvarsan or neosalvarsan in large doses in the treatment of syphilis to febrile patients. Additional indirect proof in this direction is the work of Schamberg[36] who, in a relatively recent article, advocates the use of small doses of the arsenicals in the treatment of syphilis in preference to large doses. The report of the Salvarsan Council of Great Britian[37] and the recent article by Cole[38] and co-workers definitely point to the fact that accidents in the treatment of syphilis are most frequent when large doses are used. At this point the following question presents itself: If large doses of the arsenicals prove to be dangerous at times to the non-febrile and the non-toxic syphilitic patients, why should large doses of arsenicals not have a similar action on the ill and dyspnoic sufferers of fuso-spirochaetosis?

Direct proof in favor of small doses is the experimental work of Toyama and Kolmer[39] who have shown that large doses of either arsphenamine or mercury directly interfere with the non-specific defense and diminish the production of agglutinins and lysins with which the body carries on its own defense against the invader. On the other hand, minute doses have a definitely stimulating effect on the patient and apparently encourage the formation of agglutinins and lysins.

In summarizing the possible action of small doses of neosalvarsan in the treatment of suppuration of the lungs of fuso-spirochaetal etiology, it is conceivable that the salvarsan through its specific spirillicidal action kills the spirochaetes and through its non-specific tonic action stimulates the formation of agglutinins and lysins which in turn destroy the other member of the symbiotic group.

We have in the past three years treated 35 cases of suppuration of the lungs of fuso-spirochaetal etiology with the following results:

RESULTS OF TREATMENT IN 35 CASES

Lung Abscess (18)	
Cured	8
Improved	4
Died	6
1 case of multiple abscesses as revealed by autopsy.	
1 case of multiple abscesses—sp. empyema, sp. pericarditis with effusion, sp. abscess of liver—as revealed by autopsy.	
1 case of gangrene, empyema, diabetes—as revcaled by autopsy.	
1 case of carcinoma of lung as revealed by autopsy.	
1 case of multiple abscesses. No autopsy.	
1 case of lung abscess and fuso-spirochaetal empyema—in hospital 6 hours.	
Suppurative Pneumonitis (5)	
Cured	4
Improved	1
Bronchitis (5)	
Cured (acute cases)	3
Improved (chronic cases)	2
Bronchiectasis and Emphysema (1)	
Improved	1
Tuberculosis Complicated by Spirochaetosis (6)	
Improved	5
Died (Miliary T. B.)	1

The dosages used varied. The initial dose in an adult was .15 gm. repeated every three or four days until such times when clinical improvement was marked and the sputum became negative for anaerobic organisms. At times the dose was increased to .3 gm. and at other times it was decreased to .1 gm. or even to.05 of gm. The best results were obtained when treatment was started early before extensive gangrene occurred. We observed that the very sick patients responded to the treatment better if the smaller doses were used.

By way of concluding, the author does not wish to leave the thought that large doses are always damaging and that small doses are always helpful. He only wishes to call attention to these two facts: First, that in the majority of cases large doses can do a great deal of harm to the sick patient with lung abscess or gangrene; and second, that in the majority of cases small doses of neosalvarsan when used early will prove of curative value in the treatment of this generally unrecognized and mistreated disease.

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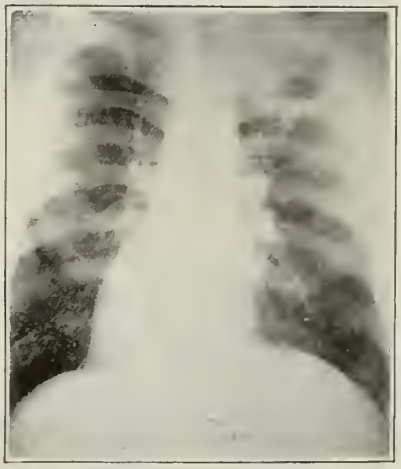


FIGURE 1

Fuso-spirochaetal lung abscess right upper lobe before treatment. (Case 1, May 13, 1933.)

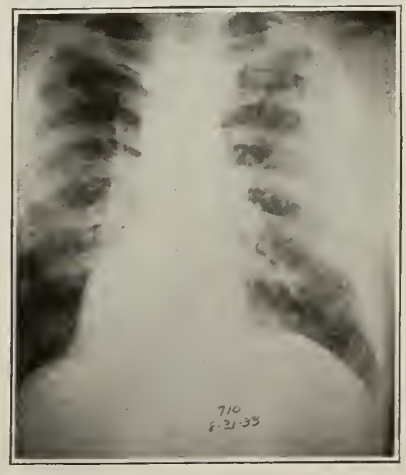


FIGURE 2

After treatment with small doses of neosalvarsan. A total of 3 gms. was used. Complete recovery. (Case 1, September 31, 1933.)

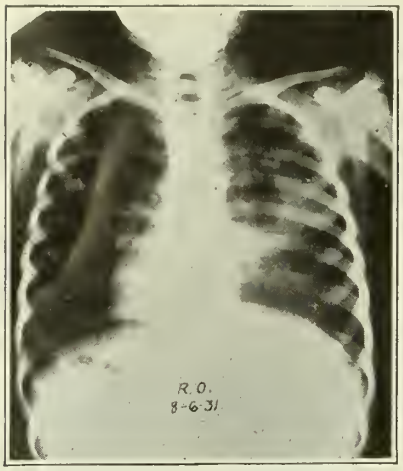


FIGURE 3

Lung abscess in mid portion of right lung before treatment. (Case 2, September, 1931.)



FIGURE 5

Spirochaetes and fusiform bacilli from washed sputum of a lung abscess.



FIGURE 4

After five injections of .1 gm. of neosalvarsan. Complete recovery. (Case 2, October 17, 1931.)



FIGURE 6

Spirochaetes, fusiform bacilli, vibrios and anaerobic cocci from a fatal case of fusospirochaetal empyema complicating a ruptured lung abscess.

Common Skin Diseases and Their Diagnosis*

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THE cutaneous affections described below include those of most frequent occurrence in children and young adults in the grade and high schools, colleges and universities. Only those that are transmissible from one student to another will be considered. The chief affections are ringworm, favus, scabies, impetigo, molluscum contagiosum and pediculosis.

Ringworm of the Hands and Feet

This affection was practically unknown in this country in 1916 when a report was made by Dr. Mitchell and the writer[1] in which a group of sixty-five patients was studied, in all of whom fungi were demonstrated microscopically. This study included patients suffering with dyshidrosis and intertriginous eczema. Some years later intensive investigative work was instituted and carried on until the affection is now accorded a prominent place in the minds of both physicians and the laity. Its importance is undoubtedly exaggerated in the popular mind. The chief criticsm at present from our standpoint lies in the fact that practically every cutaneous affection occurring on the feet and hands is viewed by the layman as ringworm and so treated. Unfortunately numerous physicans fell into the same error but to a smaller degree. On account of the popular demand for self-treatment, numerous proprietary articles are advertised and extensively sold, some of which inflict much damage. We believe that it is essential that the diagnosis of ringworm be confirmed microscopically in every case before treatment of that affection is instituted, and this we have done since the beginning. Unfortunately a large group of practitioners rely solely upon the clinical symptoms for a diagnosis.

Clinical Description—The affection was early described by Whitfield and Kaufman-Wolf. Each described three clinical types. First, acute vesiculo-bullous; second, chronic intertriginous, secondary to the first type; and, third, chronic hyperkeratotic. In our original investigation we were able to confirm these findings. The initial lesion is a vesicle and these may be single or multiple, grouped or widely distributed. The vesicle is deep seated, slightly elevated or level with the surface and resembles a boiled sago grain imbedded in the epidermis. (This comparison is always made in so-called dyshidrosis.) The content of the vesicle is serous unless contaminated by secondary infection. As a rule the early vesicles are not surrounded by redness. After several days to a week the fluid is absorbed and a brown macule remains. After desiccation the roof of the vesicle becomes torn, exposing a red, smooth, shining surface surrounded by a collarette of scales. Sometimes the roof of the vesicle develops into a brown keratotic button 1 to 2 mm. in thickness in place of scaling. Beneath these keratotic lesions the usual red, shining surface is not found. It is through the multiplication of this type of lesion that the hyperkeratotic variety of the disease is produced. In acute cases the vesicles may be grouped, become confluent and form bullae. In extensive bullous cases the patient may be incapacitated for weeks. At times well defined, shiny red, circular areas, denuded of the corneal layer through desiccation and desquamation of groups of vesicles develop in dry areas such as the center of the palm or sole or on the arch of the foot. These patches may heal spontaneously or new vesicles may continue to form around the periphery with extension in one or several directions. The grouped vesicles may develop into a dry or moist, well defined, eczematous area. In order of frequency of occurrence the affected areas are, first, the fourth interspace of the foot; second, the plantar surface of the arch and, third, the tuberosity of the fifth metatarsus. At the base of the fifth toe a fissure occupying both the interdigital and plantar area is commonly present. Occasionally similar fissures occur in the flexor folds of all the toes. In the fourth interspace a white, sodden, thickened, adherent mass of epidermis is of common occurrence produced through maceration of the exfoliated epidermis. This condition occasionally extends to other interspaces. In the keratotic variety, areas of keratoderma are formed, usually symmetrically and more often on the soles. Occasionally, a diffuse palmar and plantar keratoderma develops. One of the cases studied in our original investigation had had symmetrical palmar and plantar kera-

*Presented before the American Student Health Association at Chicago on Jan. 29, 1933.

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toderma for thirty-two years. When complicated by secondary infection there often is much swelling and edema of the under surface of the toes and contiguous portion of the soles and the intertriginous surface of the toes. Under these circumstances much tenderness and pain is experienced.

Ordinarily the subjective symptoms consist in itching which may be moderate to severe but is practically always present. In the widespread acute bullous cases, together with those complicated with secondary infection, sensitiveness and pain are characteristic. While, in the major portion of cases, the eruptive manifestations are limited to the feet and hands, occasionally well defined, scaling patches of dermatitis may occur over the trunk and limbs and in these the causative fungus can be found.

Diagnosis—The major portion of cases of dyshidrosis are examples of ringworm and also quite a proportion of the cases of the so-called intertriginous eczema together with a certain percentage of cases of localized keratoderma of the hands and feet. An immediate diagnosis can be made in practically all cases by a microscopic examination of the roof wall of the sago grain vesicle or of scales from the interdigital space, as well as from other areas on the foot. The material to be examined is placed on a slide in a drop of 10 to 20 per cent solution of sodium hydroxid. If the roof wall of the vesicle is used it is placed with its under surface upward. A cover slip is placed over the preparation and the slide gently heated until the solution boils. An examination with a 1/6 objective reveals a fungus which is seen as jointed mycelial filaments.

The affections from which it is to be distinguished are dyshidrosis, eczema and a resistant vesicular dermatitis of the palms and soles which closely resembles ringworm. In this latter affection, while the vesicles are deep seated, they are not of the dyshidrotic type and examination of the roof wall reveals no fungi. Absence of fungi in the vesicles or scales taken from the feet is important from a diagnostic standpoint. It is much less so from similar lesions taken from the palms. This is explained on the ground that in numerous cases the palmar lesions are *id* eruptions, which type is described in another part of this paper.

Etiology—In our original study, which has been continuously confirmed, men were affected more often than women and the group of cases studied had previously been diagnosed as dyshidrosis or eczema. The feet were affected much more frequently than the hands. Eczema marginatum not infrequently preceded the affection. Familial transmission occurs. Infection is more prevalent in warm weather, exacerbations occurring in the spring and autumn. Sporadic cases do occur during the winter months. Various members of the family of the epidermophyta and trichophyta are responsible for the affection. These organisms may lie dormant in calluses, under or about the nail or even in the superficial layers of epidermis between the toes for long periods of time. From these points reinfection occurs when heat and moisture develop in the warm season. Common sources of infection are dressing rooms, runways and shower baths in the athletic department of schools and universities and in athletic and country clubs. The prevalence of mycotic infection of the feet and its increase in gymnasia of universities is well shown by a report by Legge, Bonar and Templeton[2] from the University of California; 3,105 freshman matriculants were examined at the beginning of the fall gymnasium work; 51.5 per cent of the men showed clinical evidence of ringworm of the feet. At the end of the semester the same medical examiners found the proportion of involvement to be 78.6 per cent, an increase of 27 per cent. The affection was present in 15 per cent of women matriculants at the beginning of the semester and this had increased only two per cent at the end of that semester.

Treatment—The method of treatment depends on the type of eruption. When the affection on the feet is acute, accompanied by vesicles and bullae together with secondary infection, hot soaks with a 1:2000 solution of potassium permanganate used two or three times daily is efficient. In the interim between soaks, soothing ointments containing naftalan or ichthyol or both may be used. When the acute stages have subsided, an ointment containing salicylic acid and benzoic acid, originally recommended by Whitfield, is efficient. In our early work we used this or a 10 per cent chrysarobin ointment or suspension. These preparations cause exfoliation. When this is complete Hebra's unguentum diachylon alba may be employed at night with a drying dusting powder containing magnesium carbonate in the morning. This should be continued for several weeks, during which time the salicylic acid and benzoic acid ointment above mentioned should be continuously employed as a prophylactic measure around and beneath the nails and on calluses, if present. In the subacute and keratotic cases the keratolytic ointment is advisable from the beginning. In the chronic intertriginous type curettage employed when the leathery whitened mass has been softened hastens recovery. On the hands

a zinc oxide and aqua calcis lotion is advisable in the vesicular cases together with the keratolytic ointment suggested for the feet reduced 50 per cent. If the lesions consist only in dry scaling ones, the ointment will be sufficient. In certain cases injections of trichophytin may be required. These should be used with caution and the initial doses small and perhaps should be reserved for resistant and intractable cases.

Prophylaxis—Prevention on a large scale was practiced by Osborne and Hitchcock[3] in the high schools of Buffalo. Through experimental work they demonstrated the efficiency of sodium hypochlorite as a preventive measure. They recommend the employment of rubber pans approximately two feet square in which a one per cent solution of sodium hypochlorite be placed. These pans are placed in the shower rooms and the students immerse the feet in one as they go into the bath and into another as they come out. In the newer athletic departments, wells are built in the floor of the corridor passing from the dressing room to the shower baths through which the students pass. The disease in the high schools in Buffalo was reduced to a minimum through these measures.

Sterilization of the shoes, socks and other articles of clothing together with rugs and carpets which have been in contact with the feet of an infected patient may be sterilized by formaldehyde fumigation. Ayres, Anderson and Youngblood[4] recommended this method to be employed in the bedroom and bathroom of the affected individual. By the use of fumigation with a formaldehyde candle they demonstrated the effectiveness of this method. Individual prophylaxis in country clubs is promoted by the use of wooden soled sandals between the locker room and shower.

Epidermophytids

These are eruptions produced by the local action of fungi brought to the skin by way of the blood stream from older foci, usually the feet. The fungi are immediately destroyed on account of the existing allergy. These eruptions occur, as a rule, in association with ringworm of the feet. They may also be secondary to infection on the hands and in the crotch. The ringworm microorganisms are rarely present in these lesions as is shown by a microscopic examination.

Ordinarily these eruptions occur in association with acute and severe attacks of ringworm of the feet. Under these circumstances the secondary eruption has acute manifestations and runs its course in a short time. In other instances, when the primary focus presents practically no recognizable symptoms, the secondary eruption may be of longer duration. The hands are the most common site of this eruption and the lesions may be vesicular or squamous. The vesicles may be superficial or deep and the accompanying inflammatory reaction is variable as to degree. Occasionally, a more widespread eruption occurs over the forearms, legs and elsewhere which may resemble pityriasis rosea or multiform erythema. Patches of dermatitis resembling eczema occasionally occur and in rare instances the eruption may be of the general exfoliative dermatitis type.

Microscopic examination of the secondary lesion reveals no micro-organism, while at the same time they may be demonstrated abundantly in the primary affection on the feet. An excellent experimental confirmation of these affections was made by Peck[5] who produced ringworm of the feet in a human subject by inoculation with epidermophyton fungus of the trichophyton gypsum type which was followed after twenty-four days by a vesicular dyshidrosic type of eruption on the hands. The fungi were readily demonstrable in the primary infection on the feet, but the secondary eruption on the hands was free from organisms and was considered to be an epidermophytid.

Diagnosis—Epidermophytids may be distinguished from eruptions they resemble by the location of the lesions and by the accompanying ringworm infection present on the feet. The trichophyton reaction is positive and is a confirmatory finding. When the secondary eruption is eczematous, trichophyton is used by means of the patch method.

Ringworm of the Scalp

Ringworm of the scalp in children has always presented a serious problem to school officers. Some years ago in London and Paris special ringworm schools were established for the education of this type of student. At that time it required on an average of three and a half years to eradicate the affection. Exclusion from school for this length of time would be serious. Since the advent of roentgen therapy the necessity for ringworm schools has been eliminated as has also the requirement for hospital beds. The affection can be treated as an ambulatory one and cleared up in a reasonable time.

The common type in the scalp of children is that produced by the Microsporon audouini. It consists in partially bald areas of variable size in which there is a moderate amount of redness and scaling together with broken stumps of hair, each one of which is surrounded with a white sheath which is found on microscopic examination to be

spores of the causative fungi. The patches vary from the size of a small coin to an inch or more in diameter.

There are practically no subjective symptoms. The affection is insignificant aside from the disfigurement and the knowledge of its presence. Ninety-five per cent of all cases of ringworm of the scalp in children are of this type in this country and in England, 60 per cent in France and an unknown percentage in Germany and Austria. This type of ringworm was practically unknown in the latter two countries until comparatively recently.

A second type is that known as the "black dot" or disseminated ringworm of Alder Smith, produced by trichophyton endothrix. In this there are numerous small bald areas. Each bald spot involves approximately one-half to a dozen hairs. Each area shows several dark points which indicate the broken stumps of hair which in this case are level with the surface. This type is produced by the megalosporon endothrix.

The third type is the kerion usually produced by trichophyton ectothrix. This is a moist lesion resembling a flat carbuncle. It is variable in size up to as large around as a silver dollar. There are points throughout the surface from which fluid exudes. It is these points which suggest carbuncle. On palpation a sense of pseudofluctuation is present. The lesions never suppurate in the sense of forming an abscess. Incision into them, therefore, would be an error. Occasionally an inflammatory reaction in these is marked and there may be accompanying regional adenopathy with elevation of temperature and constitutional symptoms. The hairs become thin over the surface of the lesion and in time all become exfoliated when resolution takes place. While there is usually one lesion, there may be several. This affection is commonly produced by the megalosporon ectothrix. This organism is one that is responsible for ringworm of the beard and other moist ringworms of the body. It is from the kerion that dissemination sometimes occurs, producing the secondary ringworm eruption which is known as the trichophytid.

Diagnosis—The common type of ringworm of the scalp is readily distinguished clinically from alopecia areata in which the individual bald patches are completely denuded and shiny, whereas in ringworm the patch contains the broken stumps of hair. There may be short hairs in the margin of the patch of alopecia areata which resemble exclamation points. This exclamation point hair is diagnostic of alopecia areata and was originally pointed out by Crocker. The broken stumps of hair in the ringworm patch have lost their elasticity, which is shown when the finger is passed over the surface they do not return to their upright position in the same manner that normal hairs do. Finally, the removal of a hair with its sheath and its examination microscopically reveals a mosaic of small spores surrounding it. In the black dot variety trichophyton endothrix is seen as jointed mycelium lying entirely within the hair and in kerion similar appearing fungi, trichophyton ectothrix, is seen both within and around the hair. Psoriasis and seborrheic dermatitis are readily distinguished by a lack of alopecia.

Treatment—When possible roentgen therapy should be employed. With the present methods of measurement of the rays the procedure is safe in the hands of an experienced operator. It is suggested that the scalp be blocked into areas so the surface exposure will be as nearly flat as possible. The dosage of the rays is designated as an epilating dose. This by the indirect method of measurement consists of the following factors: Milliamperes 2; skin distance 8 inches; spark gap 6 inches; time 3 minutes and 45 seconds. Fourteen days after exposure the hairs fall and with them the fungi. The hairs are replaced in two months. If roentgen ray therapy is not available, the local application of iodine crystals in goose grease in the strength of 4 grams in 30 grams, vigorously and regularly applied is efficient. Chrysarobin in the strength of 5 per cent is also valuable and should be employed until reaction occurs, after which a soothing ointment is used until the reaction subsides. Care must be exercised that chrysarobin does not get into the eyes of the patient. Other applications are less efficient but at times may be necessary, such as white precipitate and salicylic acid. Thallium acetate is not recommended. While it is efficient in causing the hairs of the scalp to fall and is comparatively safe in small children, its toxic reactions are sufficiently numerous and serious to interdict its recommendation for general use.

Trichophytids

Jadassohn[6] in 1912 first recognized a connection between a generalized eruption in children and kerion. In 1914 Guth[7] described two types of lesions secondary to kerion which were first a lichenoid and second, a seborrheic or psoriasiform type. These secondary eruptions have long since been recognized as due to the local action of the micro-organism of kerion brought to the skin by way of blood stream and remaining active for but a short time when they are destroyed through the allergic state induced by the early lesion of kerion

in the scalp. This affection develops suddenly or gradually, usually at the height of the kerion or when the latter is undergoing involution and is accompanied, as a rule, by systemic disturbances of varying degree. The general involvement is evidenced by chills, elevation of temperature, malaise, enlargement of the cervical lymph nodes and sometimes of the spleen, and a variable leukocytosis. The eruption occurs chiefly on the trunk and extremities and rarely on the face.

The papules are small, follicular, acuminate or flattened, bright red early, later becoming pale or bluish-red. They may be capped with minute vesicles, pustules or scales or a horny spine may be present in the top of the papule. The lesions may be irregularly disseminated or grouped into coin-sized, oval or round patches. Less often variously sized scaling patches resembling dermatitis seborrheica or psoriasis are formed by the coalescence of the initial patches. These plaques are wholly or partially scale covered, superficial, pale to bluish-red and occasionally clear in the center producing a circinate lesion. In rare instances the secondary eruption may be of a scarlatiniform or morbiliform. Characteristic lesions simulating multiform erythema and erythema nodosum are also thus produced. The patchy, scaly type runs its course in a short time, from one to three weeks. The spinous type may last for several weeks or months. Slight temporary pigmentation sometimes follows the eruption.

The eruption has been produced experimentally by irritating the kerion with local applications, roentgen rays or poulticing. Under these circumstances it has been proved that the micro-organisms are circulating in the blood stream at the time the secondary eruption begins and they have also been found in this secondary eruption for a short time. After two or three days they are absent both in the blood and in the local lesions. These findings confirm the theory that the eruption is produced by temporary lodgment of organisms in an allergic skin where they are immediately destroyed.

Microsporids

Microsporids resemble trichophytids and are produced in the same way. The first example of this eruption was reported by Chable[8] and consisted in a lichenoid eruption accompanied by mild constitutional symptoms following the production of kerion-like lesions by treatment in an ordinary microsporon scalp infection. Further observation has shown that the eruption may occur as discrete papules or scaling patches. The papules are usually pin head sized, bright red or brownish-red discrete or grouped, some of which may present a vesicle, pustule or horny spine in the apex. The lesions occur chiefly on the trunk and extremities. The scaly patches vary in size up to that of a small coin and present a scaling margin and are brownish-red in the center. The upper portion of the trunk and sides of the neck are sites of predilection. There are no subjective symptoms in either variety. The eruption develops rapidly during a period of from one to three days and runs a self-limited course of one to three weeks. Mild constitutional symptoms are occasionally present exhibited by malaise, some elevation of temperature, nausea and joint pains.

Scabies

Scabies presents more of a problem in school children than in the university student. It is, however, sufficiently common to be of some importance. After the World War the percentage of occurrence of cases increased to about 15 from an average of about 8 before the war. The affection with its accompanying pyodermas was responsible for much of the disability during the war. Contrary to the older conception, the affection occurs in the cleanest of families as well as the dispensary class. After much observation the most common errors by physicians are found to be, first, the non-recognition of the affection and, second, its over-treatment. In a well developed case the recognition of the affection is simple. In a patient with but a few lesions it may be readily overlooked.

The characteristic objective symptoms are, in order of their importance, the gallery or cuniculus, the vesicle, and a combination of lesions due to scratching which include pustules, crusts and excoriations. The characteristic location of the lesions is between the fingers, and on the flexor surface of the wrists in all cases, about the axilla and mammary region in girls and women; in the genital region in boys and men, and over the buttocks in children. In addition to these situations the affection may occur on practically all portions of the trunk and extremities except the feet. It is sometimes present on the feet and face in nursing infants. In long-standing cases deep nodules may remain in the genital region or about the elbows and some other areas for a long period. These harbor parasites which may from time to time produce renewed activity of the affection. The gallery or cuniculus which is characteristic can always be found if diligent search is made. This exists as a black thread which may be from one-sixteenth of an inch to one inch or more in length and which usually occurs in a wavy line. The dis-

coloration is due largely to dirt which gathers in the small openings made in the roof of the gallery by exit of young parasites. The gallery is formed by the burrowing of the female itch mite during the course of which ova are deposited. Contrary to our former view, the burrow is formed exclusively in the stratum corneum. As the ova hatch, the small parasites make their exit directly above through the few cells of the stratum corneum and it is in this point of opening that the dirt collects, giving the cuniculus its color. In the examination of a patient it is invariably our custom to remove the gallery with a sharp scalpel and examine it microscopically. We are always rewarded with the finding of ova and practically always with the parasite as well. This procedure can be carried out in the youngest of patients and is of greatest diagnostic importance.

The subjective symptom of the affection is itching. This is severe at night after the patient retires and is warmed up in bed.

Diagnosis—The affection is to be distinguished chiefly from pruritus hiemalis. In this condition the affection may occur in more than one member of the family, which makes it appear contagious but when examined will be found to have occurred simultaneously, whereas in scabies there is a period of incubation in the development of the disease between different individuals. In pruritus hiemalis the lesions are only those of a traumatic dermatitis in a dry skin. There are no galleries, pustules or vesicles. Excoriations are few, the principle change being the result of trauma in a dry skin which produces roughness, torn and fractured hairs, inflammatory papules, perifollicular redness, excoriations of variable degree and, occasionally in severe cases, a secondary dermatitis. The most common areas of involvement are the legs. Other regions, such as the thighs, forearms and cutaneous surface in general, may be attacked. The itching occurs upon disrobing at night and is different, therefore, from scabies which occurs only after the patient is warmed up in bed.

The essential and important diagnostic point is the presence of the gallery and the demonstration of its contents microscopically.

Treatment—The treatment of scabies is simple if properly restricted. In the exigencies of the war a rapid method was desirable and the most efficient one developed was an ointment devised by Ehlers which is now commonly referred to as the Danish ointment. This preparation is applied after a general bath over the entire body for one or two nights and is not repeated unless, after two or three weeks, active parasites can be demonstrated. Soothing creams or oils may be applied to correct the secondary dermatitis. If this ointment is not available, a 15 per cent sulphur ointment may be employed in the case of adults and reduced in proportion to age for children. The technic of application of this ointment is important. A long continued bath with scrubbing with soap should be employed the first night, after which the ointment is thoroughly applied. Suitable underclothing should then be put on and worn continuously until the sixth morning. Each subsequent night for five nights the ointment is reapplied without a bath. On the morning following the fifth nightly application, a general bath is taken and the clothing sterilized. No subsequent sulphur is applied except as noted above after the use of the Danish ointment. Over-treatment is a common failing and is due to the following factors: When the sulphur ointment is applied the first night, itching is greatly reduced. By the third night it has practically disappeared. By the fifth night there may be some renewed itching on account of some reaction from the sulphur. When this fact is not known, the sulphur is apt to be pushed and increased in strength rather than stopped with the idea that the affection is increasing in spite of the treatment. Severe sulphur reactions sometimes occur and a moderate dermatitis is kept up over long periods when the ointment is continued. We, therefore, restrict the use of the ordinary sulphur ointment to five days and the Danish ointment to two.

Molluscum Contagiosum

Until the last ten years this affection has been uncommon. During this period it has appeared in increasing numbers until at present numbers of patients are seen each year. The degree of contagiousness appears to vary. At times several hundred pupils in a boarding school will become affected in a short time. At other times only one or two students in a school or one member of a family will have the disorder although the chances for contagion are abundant.

Aside from the disfigurement the affection is not important. In view of the fact that the lesions are usually present on the face their removal is demanded by the patient. The lesions occur characteristically on the lids and about other portions of the face, in the genital region, on the trunk and to a lesser extent on the extremities. There may be a half dozen or there may be hundreds of the lesions present. They are not accompanied by subjective symptoms, as a rule.

The lesions were compared to pearl buttons

by Jonathan Hutchinson and this resemblance is frequently noted. The lesions begin as pin head sized elevations which gradually increase in size to that of a small pea or larger. When fully developed they are rounded or semi-globular or slightly flattened and umbilicated, moderately elevated, circumscribed, firm, waxy whitish button-like lesions. In the center of the top there exists a small dark colored opening from which a milky or curdlike substance may be expressed. Occasionally this dries and protrudes from the orifice. There are sometimes several openings. The lesions are usually discrete; occasionally they may be grouped to form irregular lobulated elevations and in rare instances tumor masses occur. The lesions develop slowly, requiring several weeks to attain their full dimensions, after which they remain for an indefinite time. The commonest method of spontaneous involution is through secondary infection.

Etiology—This affection occurs most frequently in children and occasionally occurs in epidemics in institutions as noted above. While it is evidently of parasitic nature, no parasites have been discovered. It apparently belongs to the ultramicroscopic group of affections. Wile and Kingery[9] successfully reproduced the disease by intracutaneous injections of the sterile filtrate of typical lesions. Their work demonstrated that the affection is due to a filtrable virus. The histology of the affection shows it to be an epithelial tumor which is characterized by a peculiar cell which has undergone degeneration and which was formerly thought to be a parasite.

Diagnosis—The affection is to be distinguished chiefly from verrucae. The pearly, semi-translucent ovoid tumors resembling small pearl buttons could hardly be mistaken for any other infection.

Treatment—Various methods of treatment have been suggested but the one we have employed for years has been simply to prick the lesions with a cutting needle at two or three points sufficient to cause moderate bleeding. In the course of a week or ten days the lesion becomes entirely absorbed. Older methods consisted in incision of the lesion and compressing the contents and cauterizing the base with silver nitrate or phenol. Occasionally the lesions could be made to disappear by producing exfoliation with sapo viridi. The ordinary local antiseptic ointments have little or no effect. Trichloracetic acid has been suggested and used successfully by Davis[10] and others.

Impetigo

The term "impetigo" has been used to designate a number of different affections in the past. At present it is largely restricted to the contagious type of the affection described by Tilbury Fox. The impetigo of Bockhart is a folliculitis and bears no resemblance to impetigo contagiosa. Impetigo herpetiformis is a serious generalized affection which has no connection with or resemblance to the impetigo under consideration. Contagious impetigo occurs most commonly in children, although adults are frequently affected. It is this type of affection that is transferred very frequently by barber shops and is erroneously called "barber's itch." It is also the affection previously described as pemphigus neonatorum. In the warm seasons and in warm climates the affection is common and sometimes develops active and severe symptoms. The lesions occur on exposed surfaces and the characteristic one is a superficial crust which presents a "stuck-on" appearance. The earliest lesion is a macule which soon develops into a vesicle and this in turn into a pustule which desiccates, forming a superficial crust. The lesions are of the average size of a pea. They may be smaller or much larger. A single lesion runs its course in approximately ten days. After the crust is exfoliated a reddened area remains for a short time. This disappears without a sequel. In occasional cases bullae form which may also be few or numerous. These frequently dry in the center, producing rings which then suggest ringworm. It is in this type that an erroneous diagnosis is frequently made. The crusts are gummy-like, yellowish or occasionally darker colored and mixed with blood. They extend somewhat beyond the border of the original lesion and the edges are often curled upward. Underneath the crusts there is a superficial erosion exhibited as a reddened, weeping surface. In occasional instances the lesions spread peripherally, clear in the center, forming circles, and by coalescence produce a gyrate appearance. The bullous type is common in tropical countries and is the form it assumes in new born infants. Lesions of impetigo may be few or numerous and may occupy any portion of the body, though the face and hands are most commonly affected.

Etiology—While the affection occurs in the dispensary class, it also is common in all classes of society. It is initiated with a streptococcus. Other organisms are commonly associated. It is so frequently transmitted and contracted in schools that isolation is practiced. A virtual epidemic of impetigo followed the San Francisco fire when people were required to live in tents and

were exposed to flies. It is thought that the infection was spread by this insect.

Diagnosis—It is readily distinguished from pustular eczema by the presence in the latter of inflammation, weeping and itching and the occurrence of the disease in patches. From ringworm it is distinguished by the fact that ringworm rarely occurs on the face and by the superficial character of the impetiginous crust and lack of subjective symptoms. Ringworm of the beard is only mentioned on account of the fact that both physicans and laymen give the name of "barber's itch" to impetigo on account of the fact that it is contracted in barber shops, whereas the term "barber's itch" should be restricted to ringworm of the beard. Varicella, pemphigus and herpes iris are also readily ruled out though they may be considered.

Treatment—In adults the affected areas should be bathed at night with 1:2000 solution of mercuric chloride. This is followed by the application of an ointment containing five per cent ammoniated mercury. In the morning a dusting powder containing boric acid, mild chloride of mercury and talcum powder may be dusted on the surface. In children a saturated solution of boric acid may be employed for the bath and an ointment containing ammoniated mercury in the strength of 2 to 3 per cent employed. In case there is some dermatitis present between the lesions, which sometimes occurs, a 10 per cent naftalan ointment may be used at night after the bath and 3 per cent ammoniated mercury ointment in the morning. As a rule, impetigo can be cleared up in one week. Exceptions occasionally occur.

Pediculosis

Pediculosis capitis is not uncommon in school children and its recognition sometimes becomes of importance. Occasionally a child will appear with an impetiginous affection about the nose. This should always excite suspicion of pediculosis capitis. The affection itself is characterized by itching with secondary pyodermic infection throughout the scalp. The pediculus can readily be found by search as well as numerous ova attached to the hairs by a cement substance. These will be found in successive rows extending from the scalp surface out as far as an inch or more, depending upon the duration of the affection. The fact that the cleanest of children, by the close association existing in schools, may contract the affection increases its importantce.

The difficulty of its management, its long duration, even under treatment, its presence in a child or children in private families is a source of more embarrassment than discomfort.

As the parasites live on the scalp surface and attach the ova to the hairs, it is not difficult to destroy them. It is in the removal of the ova that difficulty lies.

Treatment—As a rule it is not necessary to cut the hair, even though the infestation may be marked. It is recommended that kerosene be thoroughly applied all over the hair and scalp and then, if the hair is long, it should be enclosed in a towel and fastened on as a Turkish turban for the night. In the case of short hair, saturation is all that is necessary. In the morning the scalp is shampooed with sapo viridi, after which the hairs extending as far as the attachment of the ova, are thoroughly saturated with 50 per cent solution of alcohol. Subsequent to this, if there is any dermatitis of any moment, an ointment containing 3 to 5 per cent of ammoniated mercury is applied daily together with daily saturation of the hairs in the regions of the ova with alcohol. In the course of ten to fourteen days the affection is terminated, though there may be some or even numerous dried ova still remaining attached to the hair shafts. These may be removed by subsequent combings.

Pediculosis pubis may be briefly discussed on account of transference not infrequently in gymnasia through the exchange of trunks. This affection is so characteristic that a discussion is hardly necessary. It is characterized by intense itching in the pubic region, although in occasional instances the hairs over the entire body may be involved, including the lashes. When examined small black spots are seen about the exit of the hairs in the pubic region. On close examination these are found to be parasites which have buried their heads and part of their bodies in the hair follicle. Upon removal of the parasite it will slide along the entire length of the hair on account of the hooklet on its leg surrounding the hair shaft. The ova are oval and attached to the hair with a cement substance in the same manner that they are in the scalp. As a rule, the only symptoms are the intense itching and the presence of parasites and ova on the hairs. Occasionally some secondary infection and traumatic dermatitis may be present.

In some cases of pediculosis pubis a peculiar pigmentation occurs, described as maculae cerulae. These lesions are pea to small coin size, grayish stains found on the chest, abdomen, thighs, and upper arms. They have a steel gray tint and do not disappear on pressure. It is thought that the lesions are due to the direct action of the

parasites. Different theories are entertained to explain the production and the appearance of the lesions.

Diagnosis—The diagnosis of the affection is comparatively simple. It is readily made by a careful examination of the region where the parasites and ova can be discovered.

Treatment—The practically universally used blue ointment is efficient. It is also disagreeable to employ. An ointment containing salicylic acid in the strength of six per cent and benzoic acid in the strength of 12 per cent applied after bathing the area with a solution of mercuric chloride in the strength of 1:500 is both efficient and clean. Several day's application is sufficient to clear up the affection. The ova may be removed by the application of dilute acetic acid of 50 per cent solution of alcohol. Shaving the parts is quite justifiable and shortens the course of the treatment through prevention of development of the ova. Should a secondary dermatitis be present, this is treated in accordance with the indications.

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Discussion of Dr. Ormsby's Paper

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It is with pleasure that we have heard Dr. Ormsby's clear cut exposition of some of the common skin affections which come to us in college work. I only wish that he had run the gamut of *all* skin conditions and solved our countless problems of obstinate eczemas which are aggravated by the emotional pressure of college life; of acne vulgaris, which students expect to clear up with a lotion in spite of insufficient sleep and over-indulgence in boxes from home; or poison ivy, which greets us in varying degrees of severity in spring and fall; of pityriasis rosea, which responds to patience and the sun lamp; of severe dermatitis from thoughtless exposure to the sun on the beach on the first warm day. I am sure that some of you have been annoyed by these problems, even when their solution has seemed reasonably possible. In many skin conditions the question of judgment enters in—how long to carry on one line of treatment, when to change from a salve to a lotion, the problem of soothing a dry skin or of drying a moist skin.

Unfortunately we cannot have Dr. Ormsby at our elbow to supply the judgment acquired through years of patient dealing with skin conditions. But we *can* learn much from his careful, accurate diagnosis. We should all use the microscope more frequently in diagnosing and studying skin affections. Some of us may be too prone to refer the skin case to the specialist when we might avail ourselves of the microscope in certain definite cases in order to settle the diagnosis.

There seems to be a wide difference in various institutions as to the acuteness of the problem of ringworm of the feet—some have found it an annoying problem; some have been little troubled; others, after having passed through a period of deep concern, are no longer in a panic, no longer exclude minor cases from the swimming pool, and exercise ordinary caution and good sense in prophylaxis and treatment. Dr. Ormsby brings out the importance of varying the treatment of this condition according to the stage in which it is present.

My experience in two women's colleges has not brought out the prevalence of ringworm of the scalp, pediculosis or scabies. The occasional appearance of scabies, usually among one of the college employes, is important mainly because of the discomfort and the necessity of losing time from work in severe cases.

Impetigo has become an increasing problem in colleges, and unless treated carefully, and isolated in severe cases, may spread. Fortunately early and intensive treatment renders it controllable—Dr. Ormsby doesn't mention the ultra-violet ray in addition to the mercury therapy. I have felt that it hastened recovery.

Again we would emphasize the scholarly presentation of his subject by Dr. Ormsby, and urge that greater care be taken in diagnosing skin affections early, particularly those which may be a menace on account of communicability.

Bronchiectasis

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CERTAIN notable advances have occured in the diagnosis and treatment of Bronchiectasis during recent years that deserve serious consideration. Like tuberculosis it is a disease that is yielding slowly but surely to modern diagnostic and therapeutic measures. Although still a distressing and serious disease it has lost much of the fatalistic aspect that previously enshrined it.

Classification

Bronchiectasis is divided into two types; the Congenital and Acquired. The Congenital is characterized by cystic dilatations from the bronchi or enlarged bronchi from developmental defects. It is a rare condition chiefly of interest to the pathologist. The Acquired is the type ordinarily met with and the one to be considered here. It takes three different forms based on Anatomical variations of the dilated bronchi;

(1) Cylindrical—This consists of a dilatation of the large and small bronchi, the increase being such that the size of the diameter of the smaller bronchi approximate that of the larger; the appearance resembling that of the fingers of a glove. (Wilson-Fox[1]).

(2) Fusiform—Here there is a tapering of the dilated bronchi toward their terminal extremities.

(3) Sacular—This consists of a pouch-like dilatation which may occur in any part of the bronchial tree but is most frequently present in the terminal bronchi.

These types of bronchial dilatation are diagnosed either by fluoroscopic or X-ray examination with the help of iodized oil injected into the bronchi.

Etiology

The causative factors of Bronchiectasis are two; infection and strain on the bronchial wall. The usual sequence of events is an acute respiratory infection such as pertussis, measles, pneumonia or influenza which leaves in its wake a weakened bronchial wall plus a persistent infection of the mucosa. On analysing 40 cases at the University[2] of Minnesota hospital it was found that 20 or 50 per cent gave a history of pneumonia, influenza, measles or whooping cough; 13 cases had an indefinite history of pneumonia, measles, etc., in childhood; four had a history of lung abscess. Tuberculosis, foreign body and empyema, each accounted for one.

Wall & Hoyle[3] in considering 20 cases found in 17 a definite causative history of measles, whooping cough, bronchitis or broncho-pneumonia. These findings are in accord with those of the majority of investigations on this subject. It points to the fact that Bronchiectasis in most instances is a secondary condition resulting from some previously imposed respiratory disease. A variety of organisms may be present in the Bronchiectatic process. In an attempt to determine the etiological organism Greey[4] found on analysing the removed lobes of nine lobectomies that many different types were present but that the streptococcus predominated. In three cases, however, pure cultures of a single type of streptococcus were found which showed that mixed infections were not necessary to produce the process.

Lately the importance of fusiform and spirochital organisms as causes of Bronchiectasis has come to be recognized. David Smith's[5] investigations in this field show that 80 per cent of his cases studied had this type of infection.

Beside the above factors there are other conditions that are conducive to the development of Bronchiectasis: Foreign bodies, gummata, aneurisms or tumors may by obstructing the lumen of a bronchus cause dilatation. It is a strange paradox that compression of the lung which is used in the treatment of bronchiectasis may also be a cause of the disease.

Pulmonary fibrosis and tuberculosis are also causative agents as well as acute and chronic infections of the mouth, tonsils and sinuses.

Diagnosis

The diagnosis of advanced uncomplicated Bronchiectasis offers but little difficulty. We have the history of chronic productive cough, usually copious quantities of fetid purulent sputum which separates into three layers on standing—a lower semi-solid, a middle fluid and an upper frothy layer. Dyspnoea, clubbed fingers and absence of marked constitutional symptoms also characterize the disease.

The chest signs vary but in most instances we have limited lung expansion on the affected side because of the increased pulmonary fibrosis usually associated with it. Diminished or absent breath sounds are noted and moderately coarse or coarse rales are frequently heard. A roentgen-

gram with lipiodol filling shows the typically dilated bronchi.

This is the classical picture of the advanced uncomplicated bronchiectatic patient. The diagnosis of the early case, however, requires closer study. This is also true of the case complicated by some other existing disease such as tuberculosis, anthracosis or tumor formulation. Here the Bronchiectatic condition may be completely obscured by the superimposed disease and only by careful roentgen examination with lipiodol in the bronchial tree can the condition be detected.

The diagnosis of incipient Bronchiectasis is of tremendous importance to the patient for the reason that like tuberculosis it gives the best chance for recovery if properly treated. This condition should always be suspected where a chronic cough follows one of the infectious respiratory diseases. Also where chronic cough presents itself following any of the other recognized conditions known as favoring the developing of Bronchiectasis.

The diagnosis of the incipient disease concerns itself with the differencial diagnosis of all those diseases that may simulate it in its early stages. These include tuberculosis, chronic bronchitis, pulmory abscess, pneumoconiosis, and foreign bodies in the bronchus. A detailed history, a careful physical examination, repeated sputum examination and last and most important an X-ray examination are all necessary to a correct diagnosis. It must be stated here that a roentgenogram without lipiodol for the diagnosis of early bronchiectasis is about as reliable as a roentgenographic study of the gastrointestinal tract without the barium meal. In other words it fails to bring out the detail required for accurate diagnosis and it is, therefore, most essential for the early detection of this disease to utilize the added visualization given by iodized oil for outlining in detail the bronchial tree. This need is frequently emphasized by the finding of bronchial dilatations behind the heart shadow which without the use of the iodized oil would have escaped discovery.

Treatment

The treatment of bronchiectasis is not nearly as encouraging as that of pulmonary tuberculosis. It carries with it far less assurance of a good result. The infected dilated bronchus is much more resistant to therapeutic measures than is the active tuberculous lesion. Once the infective organisms have firmly entrenched themselves and produced extensive tissue damage the outlook is not favorable. Were it but a dilatation of the bronchi the picture would be quite different for that of itself as Rist has said constitutes but an anatomical abnormality. It is the presence of infection that gives us the symptom-producing pathological process and which causes the patient to seek relief.

In dealing with the treatment of this disease let us first consider its prevention. What for instance can be done to prevent its occurence. This is a field that will never receive its just rewards for the reason that its results so frequently never become known and so are never fully appreciated. When we remember that Bronchiectasis is a secondary disease—a gift from a predecessor—we can see certain aspects in prevention that are very important. There can hardly be any doubt but that public health efforts that will prevent such diseases as whooping cough, measles and tuberculosis are leaving to humanity fewer cases of bronchiectasis than would otherwise exist. The prompt diagnosis and removal of a foreign body in a Bronchus also removes from a patient the horrors of a Bronchiectasis to follow. The exercise of proper oral hygiene according to David Smith will prevent most cases of pul. abscess and Bronchiectasis due to the fuso-spirochetal organisms. The early and effective treatment of sinus infections will mean less Bronchiectasis. We will never know the number of Bronchiectasis cases prevented by precautionary measures. They will remain the unknown benefactors of good medical treatment and will live in blissful oblivion of what they have missed.

Once the Bronchiectatic process has become developed the treatment consists first in applying measures designed to improve the general condition of the patient; more rest, good food and the correction of any condition that may interfere with body function. Bed rest as prescribed for tuberculosis is indicated for the best results. If the cough is distressing cough sedatives should be tried for symptomatic relief. It is definitely beneficial to the bronchiectatic cavities to keep them drained. In that state the infection tends to subside, the sputum to lessen in amount and odor and the general condition to improve. It is accomplished by postural drainage. It is recognized as one of the best palliative treatments we have. It should be carried out about every three hours. When the process is located in the bases the technique used is to have the patient lie across the bed with the head and shoulders close to the floor. In this way evacuation of the cavities is accomplished.

The surgical treatment of this disease has been greatly stimulated by the favorable results ob-

tained by surgery in pulmonary tuberculosis. The results on the whole have been less satisfactory but nevertheless many have been relieved and others cured by the intelligent use of surgical intervention. We are undoubtedly coming to a much earlier application of these measures than has hitherto been done. The history here being much like that in the tuberculosis field; the advanced cases being tried first as a last resort measure and finally time bringing to us the realization that the virtue of surgery lies not in late but in early application.

The principal surgical procedures used in the treatment of this disease consist of the following:

(1) Lipiodol filling of the bronchi.
(2) Compression therapy.
    (A) Phrenic exeresis.
    (B) Pneumothorax.
    (C) Thoracoplasty.
(3) Lobectomy.

The use of lipiodol in the treatment of Bronchiectasis became popular when it was found that its use as a diagnostic agent frequently led to good therapeutic results. In view of this, lipiodol soon became useful both in the diagnosis and treatment of the disease.

The exact mechanism whereby improvement occurs through lipiodol injection is not known although some believe it has a bacteriocidal action although this has not been substantiated by experiments in vitro.

There are a number of methods used in giving this treatment. The simplest and most popular consists of anesthetizing the anterior tonsillar pillars and pharanyx with five per cent cocain. When the patient is unable to swallow the anesthetic effect is satisfactory. As the patient holds his tongue out, breathes in and out deeply the warmed lipiodol is slowly introduced by means of a suitable syringe and cannula, just back of the tongue and allowed to flow into the trachea.

The patient inclines toward the affected side so that gravity causes the oil to reach the affected parts. The frequency of refills varies from a few days to a week's interval.

Ochsner[6] reporting on 112 cases of Bronchiectasis found the maximum number of fillings in any one case as 12. He found that 100 per cent were improved, 35 per cent were clinically cured, 36 per cent were clinically cured but had a relapse later. The remainder showed definite improvement but were still under treatment.

Cole, Dean & Harper used lipiodol on 30 patients with severe Bronchiectasis; 20 were markedly benefited, eight slightly to moderately improved and two showed no improvement. Other reports on the use of lipiodol are not as encouraging although it appears beyond a doubt that it is a therapeutic measure well worth trying.

The use of Phrenic Avulsion in Bronchiectasis resulted from its favorable use in pulmonary tuberculosis. The operation is of course limited to the unilateral basal lesions. In the successful cases it leads to a reduction or absence of cough and expectoration and an improved general condition. It decreases the lung volume on the affected side by about ⅓ by elevating the diaphragm.

Oakley in 17 cases treated with phrenic exeresis found four completely relieved; seven received lasting improvement; six remained stationary and one was still improving.

In Hedblooms 38 cases; nine were completely relieved, 20 showed marked improvement and two were unimproved.

Artificial Pneumothorax is indicated in the unilateral case, which is free from pleural adhesions.

A contraindication is mentioned for those cases having parinchymal infections or lung abscesses because of the dangers of a resulting empyema. If the infection or abscess, however, is located centrally and adjacent to a draining bronchus I see no reason why pneumothorax therapy would not be all the more indicated in that the resulting lung pressure would tend to facilitate drainage and encourage healing.

The number of unilateral cases suitable for pneumothorax treatment decreases with the age of the lesion. The earlier the Bronchiectasis is discovered the better are the chances of finding a free pleural space. Rist[9] found that 37.2 per cent of his cases had pleural adhesions that prevented induction of pneumothorax. Rist strongly advocates the earlier instituion of pneumothorax treatments in Bronchiectasis. In his series of 37 patients where collapse was obtained 17 were not benefited; 20 were markedly helped. The cough and expectoration disappeared as well as the fever and weight loss. In 13 the cure has lasted for 3, 5, 6 and 8 years after discontinuance of the treatment. Tillman in 65 cases found that 36.3 per cent became free of symptoms.

Thoracoplasty is reserved for those cases that fail to benefit from phrenic avulsion or pneumothorax. In this group we find the unilateral atelectatic and Cirrhotic types with retraction of the mediastinum to the affected side as suitable for the operation.

Hedbloom[10] in 11 cases with the five stage operation found two clinically cured; seven work-

(Continued on Page 592)

Treatment of Congestive Heart Failure and its underlying Principles*

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UNDER the strain of its diseases, the heart may be unable to maintain adequate circulation, so that stasis occurs in various parts of the body. This is evidenced by dyspnea, frequently by orthopnea, edema, anasarca, varying degrees of cyanosis, and congestion of the liver and other viscera, constituting the well-known syndrome of congestive heart failure. Practically every form of cardiopathy is ultimately capable of producing this syndrome.

In considering treatment for congestive heart failure, the attempt will be made to link the various therapeutic measures employed with the major factors underlying the various forms and stages of circulatory failure. In order to clarify the ensuing consideration of certain mechanical factors, it is deemed advisable to review the circulation according to its individual components. The heart is necessarily considered as a bilocular organ, consisting of right chambers, left chambers, and the pulmonary vessels passing between them. The peripheral circulatory channels, the great arteriolar-capillary bed of the body, comprise the systemic circulation, communicating with the heart by the various arterial and venous trunks of the body. With this relatively simple scheme in mind it becomes possible to visualize with some accuracy some of the disturbances occurring consequent to failure of the heart.

Production of Heart Failure

Diseases of the cardiovascular system project their influences on the heart in various ways, and an understanding of these differences is necessary to proper interpretation of the effect of the various lesions as expressed in terms of cardiac strain. For instance, such conditions as hypertension, coronary disease, aortic stenosis, aortic insufficiency and adherent pericarditis primarily and predominantly exert strain on the left ventricle. In contrast, conditions such as sclerosis of the pulmonary artery, pure mitral disease, and certain pulmonary diseases notably emphysema, extensive pulmonary fibrosis and congenital pulmonic stenosis, primarily and predominantly overburden the right ventricle. However, in practice, clear-cut instances of failure of the left and of the right sides of the heart are not commonly observed, owing to the fact that cardiac lesions are prone to be multiple. Even in cases in which lesions are wholly confined to one side or the other, both sides are ultimately affected.

When the left ventricle begins to fail, it becomes unable to expel the blood sent to it, through the lungs and left auricle, by the normally acting right ventricle. This soon influences the pulmonary circulation, pressure within it is raised, stasis develops, the lungs become congested, and if this train of events occurs rapidly, edema of the lungs may appear. Under these circumstances the patient becomes dyspneic and cyanotic, the phenomena varying with the extent of impairment of ventilation. When anoxemia has reached a certain degree, cardiac function becomes more impaired, because heart muscle is very intolerant to oxygen-want.

Owing to the progressively increasing resistance against which the right ventricle is required to work, its function becomes impaired and the tricuspid valve ultimately becomes incompetent, with the result that the systemic venous circulation becomes engorged, thus to some extent, relieving the pulmonary circulation. It is at this stage of heart failure that amelioration of dyspnea and cyanosis may be witnessed, while the dependent tissues become edematous and fluid accumulates in the abdominal cavity. Arterial pressure frequently becomes lowered.

With continued and progressive cardiac failure, both ventricles now participating, the pulmonary circulation becomes the seat of progressive stasis, as stasis also progresses in the systemic venous circulation. Continuation of these disturbances obviously leads to the patient's ultimate dissolution.

When failure primarily affects the right ventricle the initial train of events is somewhat different. The right ventricle experiences difficulty in expelling its charge of blood, with the result that the tricuspid valve soon becomes incompetent; stasis and later engorgement of the systemic venous circulation ensue. Failure of the pulmonary circulation occurs secondarily; that is, the order in which the pulmonary and the venous circulation becomes engorged is the reverse of that occurring with primary left ventricular failure.

*Read before the South Dakota State Medical Association, Mitchell, S. D., May 16, 1934.
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One must realize, however, that the series of events I have related may not be distinctly observed in clinical cases, owing to the fact that even under conditions of disease, the cardiovascular system possesses remarkable powers of adaptation and enrolls all the available functions of its various components before submitting to defeat. Likewise, the compensatory factors in different persons apparently behave variably, under seemingly identical conditions. Although the mechanical factors underlying heart failure are of great importance, influences resulting from circulatory inadequacy are also of unmistakable importance, in the ultimate problems of heart failure. Among the effects is anoxemia, which disturbs the functional activity of the heart and of the central nervous system, as well as of all parts of the body, but apparently not to the same degree. Relatively little exact information is available regarding the metabolism of heart muscle, although the metabolism undoubtedly becomes profoundly affected in heart failure. There are still many points of conjecture regarding the problem of cardiac edema, although the relationship of certain mechanical factors seems explicable.

Landis inserted minute tubes into the capillary loops, and showed by his studies of blood pressure in the capillaries, that distinct differences exist between pressure in the arterial and in the venous portions of the loops. The osmotic pressure of the tissues was found to average 25 mm. of mercury. The average pressure in the arterial end of the capillary loop was found to be 32 mm. of mercury, that in the venous end to be 12 mm., while that in the arch of the loop was 20 mm. This status obviously permits the fluid elements of the tissues to enter the venous side of the capillary loop with facility, owing to the difference between the osmotic pressure in the tissue and that in the venous capillary. However, when venous pressure becomes increased, which frequently occurs in congestive heart failure, the reversal of conditions of pressure permits the fluid element of the blood to seep into the tissues and remain there as long as the imbalance persists.

Principles of Treatment

The treatment of congestive heart failure rests, essentially, on three principles: (1) Measures primarily directed toward the heart in which the attempt is made to permit the heart to obtain more rest and thereby to increase the efficiency of its function; (2) measures instituted principally to relieve consequences of heart failure such as edema, accumulation of fluid in the serous cavities, anoxemia, increased venous pressure, and so forth; relief of these conditions obviously relieves the burden on the heart, and (3) institution of an individualized regimen directed toward maintenance of circulatory adequacy.

Treatment

The primary procedure in the treatment of congestive heart failure is placement of the patient at complete rest in bed, with elevation of the upper part of the body. The patient should not be permitted to leave the bed under any conditions. Interruption of rest, such as occurs when the patient is permitted to visit the bathroom, is frequently the factor that results in failure of the instituted regimen.

Digitalis, the therapeutic agent most commonly used in heart disease, was brought to the attention of the medical world by William Withering nearly a century and a half ago. Despite the long usage of this drug, it is probably the most misused drug in present-day therapeutics. Many physicians prescribe digitalis on making the diagnosis of heart disease, regardless of type of lesion or state of function, and frequently on the mere suspicion of the existence of heart disease. Such therapeutic indiscrimination indicates the traditional domination of an unenlightened era and clearly shows a lack of understanding of the actions of the drug.

Many actions have been assigned to digitalis, many of which have not withstood the test of time and experience, a fact unquestionably contributing to the existent confusion regarding its actions and indications. The effect of digitalis on the diseased heart of man is now narrowed down to three definite actions, understanding of which greatly simplifies the practical indications and contraindications for its use: (1) Digitalis depresses the function of the sino-auricular and auriculo-ventricular nodes, resulting in a tendency to slowing of cardiac rate. This is partly a vagal action. (2) It depresses cardiac conduction throughout the muscle and increases the refractory period of both the auricles and the ventricles. Depression of conduction, particularly through the aurivuloventricular (His) bundle, occurs, and explains the striking action of the drug in many cases of auricular fibrillation. (3) It increases the amplitude of cardiac contraction; it tends, also, to restore tonus, apparently because of its direct action on heart muscle.

The most striking indication for administration of digitalis is congestive heart failure, when auricular fibrillation is present, when the ventricular rate is rapid, and when discrepancy exists between the apical and the peripheral arterial pulse. Probably the most dramatic results that occur

with administration of digitalis are observed under these circumstances. Although digitalis is indicated under other conditions, its beneficial effects are prone to be less conspicuous. I have in mind, particularly, the patient with congestive heart failure, but whose heart beats in regular rhythm and not excessively rapidly. Additional therapeutic measures are usually necessary to restore circulatory competence.

After restoration of cardiac function, digitalis is frequently indicated, preferably administered for two or three consecutive days each week. This is particularly true if auricular fibrillation is present. Under any condition administration of digitalis should be discontinued before the development of toxic signs or symptoms. Toxic phenomena such as nausea and vomiting are well known and readily recognized, but the symptoms of cerebral intoxication are apparently not so well understood and warrant emphasis. They consist of giddiness, disturbed color vision, delirium and coma, and may occur independently of nausea and vomiting. This status is extremely dangerous and not infrequently ends in death.

Mercurial diuretics, novasurol (merbaphen) and salyrgan (mersalyl), have been the most outstanding contributions of recent years to the treatment of congestive heart failure. Novasurol is a double salt of sodium mercurichlorphenyl oxyacetate with diethylbarbituric acid. It contains 33.9 per cent of mercury. Salyrgan is prepared by the action of mercury acetate and methyl alcohol on salicylallylamido-o-acetic acid and subsequent conversion to the sodium salt. It contains, when dried to a constant weight, 39.6 per cent of mercury in nonionizable form.

The mercurial diuretics appear to act by mobilizing sodium chloride and water in the tissues and causing them to be excreted in the urine. The action presumably is exerted on both the kidneys and other tissues. Diuresis usually begins within a few hours after intravenous administration of 1 to 2 c.c. and the maximal effect of the single injection is invariably achieved within the first twenty-four hours. Injections may be given at intervals of three or four days. It is not unusual for the urinary output to range from 3,000 to 8,000 c.c. in the first twenty-four hours succeeding administration of the drug.

Dramatic improvement in the patient's condition frequently occurs very soon after release of large quantities of fluid, thus enormously relieving the load on the heart by lowering the peripheral resistance. The general circulation improves, venous stagnation disappears, venous pressure falls if the disease has caused it to be increased and oxygenation of the tissues becomes more adequate.

The mercurial diuretics are contraindicated in acute glomerulonephritis but caution must be used not to confuse the urinary evidences of heart failure with those of nephritis. Enteritis is likewise a contra-indication to the use of these mercurial substances. Extreme caution must be exercised in administering these drugs, for the introduction of minute amounts into the skin results in a slough that requires considerable time to heal.

The long-continued intravenous injection of either novasurol or salyrgan leads to local venous thrombosis, and consequently their use is ultimately prevented. Under such conditions they may be injected deeply into the muscles of the buttocks and experience at The Mayo Clinic has shown that novasurol is more effective than salyrgan when administered intramuscularly.

The diuretic salts, ammonium nitrate and ammonium chloride, are valuable adjuncts in the treatment of cardiac edema, as has been demonstrated by Keith and his associates. At times release of edema fluid by the use of mercurial diuretics is slow and incomplete, and the supplemental administration of these salts results in very satisfactory diuresis. Not infrequently, use of these salts alone results in mobilization of fluid. They apparently act directly on the tissues of the body; the ammonium radical forms urea and the acid ion apparently predominates in liberating fluid. An increased urinary output of water, acid, chlorine, ammonia and total inorganic base occurs. The drug is best given in enteric coated pellets, and the usual dose is 4 to 6 Gm. daily. Administration must not be too protracted, owing to the tendency of the concentraion of urea in the blood of some patients to become elevated. It is frequently desirable to administer these salts three or four days preceding injection of the mercurial diuretics, and then to discontinue administering them. The presence of marked retention of nitrogen would ordinarily contraindicate their use, but if other methods of treatment failed to mobilize retained fluids, their cautious use would be warranted. When the stomach will not retain administered substances, as it sometimes will not when visceral congestion is marked or digitalis has been unwisely used, either salt may be administered in solution by rectum.

The purine diuretics likewise have a place in combating cardiac edema. They consist chiefly of theobromine sodium salicylate, theobromine, theophyllin and caffeine. As a rule, their effect is less spectacular than that of the agents already considered. They tend to cause liberation of

water, sodium, and chlorides from the tissues and apparently exert their influence on the kidneys and on the other tissues of the body. These drugs are usually administered orally in doses of 0.3 to 0.6 Gm. three or more times daily. When results are not evident within a few days, their continued administration is of doubtful value.

Venesection, one of the oldest therapeutic procedures, occupies an important place in the treatment of congestive heart failure. Present day medicine has almost abandoned this procedure, yet its intelligent application is often a lifesaving measure. It is particularly effective when the pulmonary circulation is engorged, for it reduces the volume of venous blood, which diminishes the pressure of the blood in the heart in diastole, thereby diminishing cardiac dilatation and making possible more efficient cardiac contraction. This often permits the heart to keep pace or even to overcome load, and frequently is the turning point in the restoration of function. The quantity of blood withdrawn usually ranges from 300 to 600 c.c., and the procedure may be repeated from time to time as the indications arise.

Other mechanical measures employed in the treatment of congestive heart failure consist in aspiration from the body cavities of retained fluid, introduction of Southey's tubes into edematous extremeties, or multiple puncture or cutaneous incision of these edematous parts. Fortunately, however, these procedures are rarely necessary, testifying to the remarkable efficacy of the measures already considered.

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BRONCHIECTASIS

(Continued on Page 588)

ing full time with slight sputum; two unimproved.

Sauerbruck[11] with 27 cases obtained five clinical cures; 12 were improved, and one became worse.

The last surgical procedure to be considered is Lobectomy (Excision of the lobe of the lung). It is done in those cases where the Bronchiectasis is localized to a single lobe. It is a serious operation and the mortality is high—approximately 50 per cent. Recently, however; with improvement in technique, by the help of the cautery and with a better selection of patients Graham[12] in his series of 20 cases had only a 20 per cent mortality with 30 per cent of clinical cures and 30 per cent that were well except for persistent fistula.

Theoretically lobectomy should be the treatment of choice for Bronchiectasis because it removes in toto the diseased area. However, the limited number of lesions confined to a single lobe as well as the seriousness of the operation make it at present the least popular of our radical surgical procedures. It has its place, however, and in many instances gives a clinical cure where other measures have failed to help the unfortunate victim of this harassing disease.

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The Indications for Bronchoscopy in the Diagnosis and Treatment of Pulmonary Diseases

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MOST of the advances that have been made in the diagnosis and treatment of internal diseases have followed perfection of procedures leading to direct or indirect visualization of individual organs.

A striking illustration of this fact is the improvement in diagnosis and treatment of pulmonary diseases that has followed more general employment of direct visualization of the tracheobronchial tree with the aid of the bronchoscope. This instrument was devised originally for removal of foreign bodies from the trachea and bronchi, but in most bronchoscopic clinics at present this indication for bronchoscopy applies to less than 10 per cent of the cases in which it is employed.

In spite of the increasing number of patients who are being subjected to bronchoscopic study, there are many who have undiagnosed chronic pulmonary diseases and who could be benefited or cured of their disability if members of the medical profession in general were more familiar with the value of this examination. It seems likely that the fact that the bronchoscope was first used for extraction of foreign bodies so focused attention on the field of endeavor that the very conditions that led to employment of the instrument have been the greatest factor in preventing knowledge of its wider application and thus limiting its use.

If a physician observes an examination of a small child who has a foreign body in the bronchus, and the examination is made in an institution where equipment is insufficient and the personnel is not technically trained, the physician has little incentive to refer patients for such examination except for emergency conditions. However, at present there is a sufficient number of well-trained bronchoscopists, and they have the use of adequate equipment, to care for all patients who require their services. Cooperative effort of physicians in any community would enable two or more bronchoscopists to acquire the necessary training for doing this type of work, so that patients would not have to travel long distances in order to obtain the service.

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Save for removal of foreign bodies from the tracheobronchial tree, bronchoscopy has been employed in chronic rather than in acute conditions of the lung. This may not continue to be the case, for accumulating evidence suggests that bronchoscopic aspiration of the bronchi may be indicated in the early stages of all types of pneumonia. Rather dramatic results have followed bronchoscopy in the treatment of postoperative atelectasis of the lung. Instead of administering carbon dioxide immediately after general anesthesia has been completed, it would seem that bronchoscopy, with aspiration of all secretion from the trachea and bronchi, would serve well to prevent pulmonary complications. The general indications for bronchoscopy in the diagnosis and treatment of chronic pulmonary diseases will be considered under the following headings: (1) asthma and asthmatic bronchitis; (2) suppurative diseases of the lung and pleura; (3) tuberculosis, and (4) neoplasms.

Asthma and Asthmatic Bronchitis

The value of direct inspection of the trachea and bronchi is not nearly so great in cases of asthmatic bronchitis as it is in cases in which a wheeze simulating that of asthma is caused by actual organic obstruction of the trachea or a bronchus. Therefore, the chief benefit to be derived from bronchoscopy in cases of asthma is definite confirmation of the diagnosis of this malady. The symptoms of a few patients who suffer from asthma have been greatly reduced by bronchoscopy, although the reason for improvement is difficult to ascertain. Every patient who suffers from asthma or asthmatic bronchitis should be subjected to at least one bronchoscopic examination to determine the accuracy of the clinical opinion.

Suppurative Disease of the Lung and Pleura

The greatest indication for bronchoscopy is in those cases in which there are suppurative processes of a nontuberculous nature in the lung and pleura. In abscess of the lung, the disease can be definitely located, and bronchial strictures can be dilated. Marked improvement or permanent cure will follow adequate drainage and removal from the bronchi of unsuspected foreign bodies. It must be stressed that foreign bodies in

the bronchi may result from ulceration of calcified hilar nodes through the bronchial wall. So many cases of this type have come under observation that the condition should be suspected in every case of chronic unilateral nontuberculous pulmonary suppuration.

The results of bronchoscopic aspiration of the lungs for bronchiectasis have not been beneficial in many of my cases. However, confirmation of the diagnosis, and the relief occasioned by aspiration of secretions, to those patients who have had marked toxic effects from prolonged absorption of purulent secretion, is sufficient to warrant examination of all patients who suffer from this condition.

In certain cases, it is difficult to determine by ordinary examination, or even by bronchoscopy, whether suppuration is in the substance of the lung or whether a small empyema pocket has ruptured into a bronchus. Injection of iodized oil through the bronchoscope, directly into the draining bronchus, frequently will establish a correct diagnosis. In my experience, this is the only condition in which injection of oil that is opaque to roentgen rays affords any more information than can be obtained by ordinary bronchoscopic study.

The various mycotic infections of the lungs can be diagnosed as a rule without bronchoscopy, and it is not desirable to subject the patients to any examinations that are not necessary for diagnosis.

Tuberculosis

In unusual types of tuberculous infection of the hilar lymph nodes, ulceration into a bronchus may occur, or infiltration of the wall of the bronchus, near the hilar region, may take place, and exact diagnosis cannot be established without bronchoscopy and removal of tissue for microscopic study. In these cases, bronchoscopy is not only desirable but is imperative if exact diagnosis is to be obtained. However, in the usual cases of pulmonary tuberculosis, bronchoscopy should not be done unless there is fairly definite clinical evidence of some associated lesion, particularly one producing bronchial or tracheal obstruction. It is difficult to be certain that introduction of a bronchoscope into the trachea and bronchi has any tendency to cause progression or dissemination of a tuberculous lesion in the lung, but spread of the lesion after bronchoscopy very likely would be attributed to the instrumentation. If tuberculous lesions are present in both lungs, one might be permitted to employ bronchoscopy to ascertain the source of a pulmonary hemorrhage that could not be localized by other means.

Neoplasms

The increasing incidence of new growths in the trachea and bronchi, and their frequent recognition by bronchoscopy, is another reason for the employment of this examination in diagnosis. Although it is true that the majority of bronchial growths are malignant, and the ultimate outlook for the patients is hopeless, yet a few may be cured by radiotherapy or surgical removal of the growths. Benign growths may occur, and their identification and removal by fulguration has brought relief from symptoms in a number of instances.

General Indications

Only slight discomfort, and usually no risk, accompany bronchoscopy. This emphasizes the desirability of employing direct inspection of the tracheobronchial tree in the presence of a great variety of obscure pulmonary affections, in which definite diagnosis cannot be reached by ordinary methods of examination. As a matter of fact, in the presense of many diseases of the lung, examination should be considered incomplete without this study.

Chronic Passive Congestion of the Lungs or Cardio-Pneumo-Fibrosis: With a Review of Twelve Cases Confused With Pulmonary Tuberculosis*

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IN THE routine examination of patients in the Admission Ward at the Municipal Tuberculosis Sanitarium, we commonly encounter various conditions that simulate tuberculosis so closely that it requires much special investigation to arrive at an absolute and accurate diagnosis. One of the most common diseases of this class is Chronic Passive Congestion. Although this condition is relatively simple to differentiate on extended study, it is sometimes confusing on preliminary examinations because many of the early symptoms and signs are identical with those of pulmonary tuberculosis. I shall attempt to present the various likenesses and differences and point out the various differential criteria of diagnosis.

While certain clinical and X-ray findings are similar, there is little in common in the pathologic findings, as shown by the classic description of Chronic Passive Congestion of the lungs by MacCallum,[1] which is as follows: "Grossly, the lungs are pale, dry or edematous, feel dense and elastic, and are of a distinct rusty brown color. Microscopically, the capillaries in the alveolar walls become greatly dilated and tortuous so that they project in loops into the alveolar cavities. The alveolar epithelium is ill-nourished and very many of the cells are desquamated into air cells; fluid exudes from the tense capillaries often with red blood corpuscles. These quickly disintegrate and hemosiderin is formed from their hemoglobin and are taken up by the phagocytic cells. In the lungs, they are generally sufficiently numerous to give a distinct rusty color to the cut surface. The smooth muscle in the septa, that form the vestibule in each lobule, is greatly increased in bulk and in extreme cases the alveolar walls become thickened and indurated by the appearance of new connective tissue."

It is produced by anything which obstructs the venous return of the lung. Mitral lesions, especially mitral-stenosis, is the most common cause. Congenital heart lesions, especially Patent Ductus Botalli, produced very marked passive congestion. It is also produced by other valvular lesions, chronic myo-cardial insufficiency and the hearts secondary to contracted kidneys. Also other mechanical factors, such as mediastinal tumors and marked kyphoscoliosis, may be the cause.

Assmann[2] has described the Roentgen appearance of Chronic Passive Congestion. The subject has been reviewed in 1923 by Holmes and Dann,[3] and in 1930 by Sante.[4] Assmann presents experimental proof to show that the hilus shadows in a normal lung are largely formed by the pulmonary arteries and that the bronchial shadows appear only against the denser background cast by the pulmonary arteries. Further the lymph glands and the lymphatic vessels, along with the pulmonary veins only enter into the X-ray shadows to a slight extent. His experiments also demonstrate that the shadow strands radiating from the hilus region in the normal lung are formed principally by the pulmonary arteries. The bronchi are only evident here and there where the film is unusually distinct and are differentiated by the light band in their center. According to Assmann simple passive congestion of the pulmonary veins does not produce any change in the roentgen picture. It is only where the congestion proceeds through the veins and the capillary bed of the lungs and dams back into the pulmonary arteries with right heart hypertrophy that the X-ray shadows show any notable changes.

The X-ray changes may be grouped under four heads:

I. There is a general haziness over the film, as though it were under-exposed or under-developed. This is especially emphasized by Assmann as being characteristic.

II. Changes in the hilus shadows. These consist in a widening and increase in size due largely to an increase in the size of the pulmonary arteries. Assmann states that an increase in size of more than 15 millimeters is a definite indica-

*Material presented before the Mississippi Valley Sanatorium Association meeting at Kansas City, Mo., October 5, 1933.
†From the Admission Ward of the Chicago Municipal Tuberculosis Sanitarium.

tion of pathological congestion. This hilus shadow is characterized by an even increase in density and a hazy border.

III. Changes in the shadow strands radiating from the hilus. These are increased in width and density. They may be recognized by the gradual decrease in size and density, as the strands radiate towards the lung periphery. Along the course of these shadow strands there are the oval and round shadows with dense centers, which are probably due to the orthoroentgenograde appearance of the enlarged pulmonary arteries.

IV. Parenchymal changes, due to the increased fibrous tissue in the alveolar septa, are only evident in the most marked cases. This appears as a diffuse mottling in the lung parenchyma between the shadow strands and beyond them in the lung periphery.

There is usually the characteristic appearance of the heart shadow, varying with the type of lesion present, but most frequently resembling the mitralstenotic configuration.

It is our belief that the recognition of Chronic Passive Congestion is usually easy and should lead to no difficulty because it only appears when the primary pathology, such as mitral-stenosis, is definitely developed and of some considerable duration. At the Municipal Tuberculosis Sanitarium, Chronic Passive Congestion is confused with tuberculosis, on account of the marked similarity of symptoms. This is especially true in the cases that showed repeated hemotysis of a dram or more. In these cases the cardiac condition is easily recognized, but care must be taken to rule out an associated chronic type of tuberculosis. In addition to the usual methods of observation we have ruled out tuberculosis by the use of repeated sputum cultures.[5] We have found that conclusive evidence ruling out tuberculosis could be obtained in a considerable number of these borderline cases, by the use of the graded Mantoux reaction.[6] In the Positive Mantoux cases, it was found that those who could tolerate 10 milligrams of Old Tuberculin subcutaneously, could be regarded as non-tuberculous with a high degree of certainty.[7]

In a review of 120 cases discharged from the Municipal Tuberculosis Sanitarium with a definite diagnosis of "No Active Tuberculosis," (years 1929 to 1933) twelve cases, or 10 per cent of the total, were found to be Chronic Passive Congestion of the lungs. The accompanying chart gives a resume of the principal symptoms and findings, in these twelve cases. It will be noticed that cough was present in all cases, and that expectoration of considerable amounts of mucopurulent material was present in nine. Hemoptysis of more than one dram was present in seven of the twelve cases and streaking was present in nine, so that one or the other form of hemorrhage was present in all but two of the twelve cases. Loss of weight was very noticeable and was present in all but two cases. It is significant, that while these cases presented the other cardinal symptoms of tuberculosis, none of them had an afternoon temperature of more than 99.4, and in only one case, was there a persistent low-grade febrile reaction. Dyspnea of a moderate degree was present in all but one of the cases in the series. While this dyspnea was never found to be very severe and was not associated with any orthopnea, its presence in some degree, seems to

Name	Cough	Expectoration	Hemoptysis	Streaking	Fatigue	Weakness	Loss of Weight	Temp.	Dyspnoea	Heart Lesion	Sputum		X-ray Findings		Skin Tests		Electrocardiograph
											Reg.	Cult. C.P.	Heart	Lungs	Mantoux	Subcut. O.T.	
A.R.*	++	++	0	+	++	++	40 lb.	low grade	++	Mitral Sten. Auric. Fibr.	Neg.		Mitral Configur.	Classical			
H.D.	++	++	Freq. +++	+++	++	++	20"	Norm	++	Mitral Sten.	"	Neg.	"	"	1mg.	Neg.	Rt. Axis Dev.
L.B.	+	+	2oz.	+++	++	++	20"	"	++	Mitral Sten.	"	"	"	"	Neg.	Neg. 100 mg.	Rt. Axis Dev. Myo. Damage
O.R.	+	+	1 Dr.	++	++	++	0	"	++	Mitral Sten. Hypertr. ++	"		" (Slight)	"(Ext)			Rt. Vent. Prep. Myo. Dam. at Ms
P.F.	++	+	0	++	++	++	12"	"	+++	Mitral Sten.	"		" (Mod.)	"			
C.N.	+	+	1 Dr.	+++	+++	+++	22"	"	+++	Mitral Sten.	"	Neg.	"	"	+		Rt. Axis Dev.
H.N.	+	0	0	++	++	++	7"	"	+	Mitral Sten.	"		"	Moderate C.P.C.			
F.P.	++	0	1 Dr.	++	++	++	10"	"	++	Double Mitral	"			Moderate C.P.C.			
P.J.	++	0	0	0	0	0	0	"	0	Mitral Regur.	"		Normal	Normal			
L.W.	+++	+++	+	++	No Rec.	No Rec.	20"	"	+++	Aortic Aneurism	"		Aneurism	Marked Congest.			L. Vent. Prep. Invert. T_3 T_3
J.P.	++	++	++	0	++	++	5"	"	+++	Mitral Sten.	"	Neg.	Mitral Configur.		Neg.	Neg. 100 mg.	Rt. Axis Dev.
C.G.	++	+++	0	0	++	++	28"	"	+++	Mitral and Aortic	"	"	Mitral and Aortic Configur.	C.P.C.	+	Neg. Mild at 5 mg.	Normal

* Post mortem: brown induration

be necessary to the diagnosis of Chronic Passive Congestion. Two of the twelve cases had a negative Mantoux reaction in 1/1 dilutions and further showed no systemic or focal reaction after the injection of 100 milligrams of Old Tuberculin subcutaneously. Brown induration of the lung was shown in the only case that came to the post-mortem table.

The x-ray findings in these cases conform in general to those so well described by Assmann and more recently by Sante. The general haziness described by Assmann, was not so definite in our cases. All of the cases showed the typical widening of the hilus shadow and the increased density of the shadow strands radiating from the hilus. Along these strands the oval densities of the ortho-roentgenograde shadows of the pulmonary vessels are seen. In the more marked cases there is a very definite mottling in the lung parenchyma, which is very similar to the mottling in some types of pulmonary tuberculosis, except that the margins are very hazy and there is not the definite beading seen in tuberculosis.

Other conditions which must be differentiated from this condition include Bronchiectasis, Pneumoconiosis, and Osler's disease, "cold," miliary tuberculosis in its early stages. In bronchiectasis we have found that the x-ray findings are usually localized to one side or to the lower lung fields. In cases of doubt, the use of Lipiodol has always been conclusive. In pneumoconiosis, there is the history of exposure to some form of dust, and the x-ray has a characteristic distribution of shadow densities in the middle and lower lung fields, in all except the most marked cases in which the whole lung is involved. There is not the definite widening of the shadow strands radiating from the hilus and the cardiac shadow usually has a normal configuration.

Case A. R. Housewife. Female, Age 31. Admitted with a diagnosis of Pott's disease, January 10, 1928. The Pott's disease was of five years duration and had been treated surgically, with an Albee operation. She was in apparent good health, except that she complained of fatigue, cough and expectoration, of two months duration. Her sputum was frequently streaked with blood, she had pains in her chest, nightsweats, and an occasional afternoon temperature. Physical examination showed some impaired resonance in the apices, and the breath sounds were suppressed over the same area. There were also the typical cardiac findings of mitral-stenosis. Sputums were negative. After a period of one month she developed auricular fibrillation. She died two months after admission with a terminal tuberculous meningitis. Post-mortem examination by Dr. Sweany revealed a healed hypertrophic rheumatic endocarditis with stenosis of the mitral valve. There was also chronic passive congestion of the lungs (brown induration) with passive congestion of the liver, spleen and kidneys. In this case the x-ray (see figure 1) was taken on admission and the x-ray (see figure 2) was taken after the development of auricular fibrillation. This has considerable mottling which could simulate the "snow-storm" appearance of miliary tuberculosis, but the autopsy findings were those of a typical brown induration of the lung and the only tuberculosis found, was that of a largely healed Pott's disease, with a terminal meningitis.

Case, H. D. Clerk. Male. Age, 24 .Admitted to four different sanitariums for tuberculosis. His principal symptoms was repeated hemoptysis. His

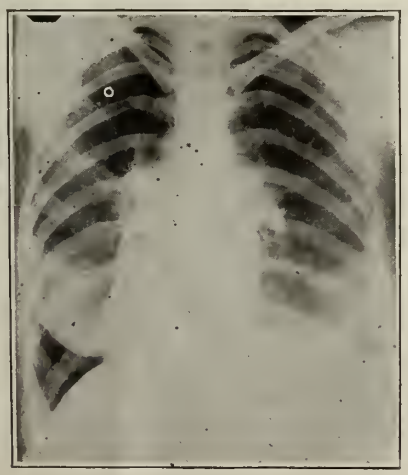


FIGURE 1

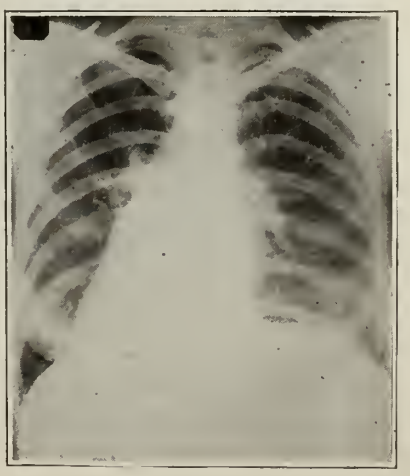


FIGURE 2

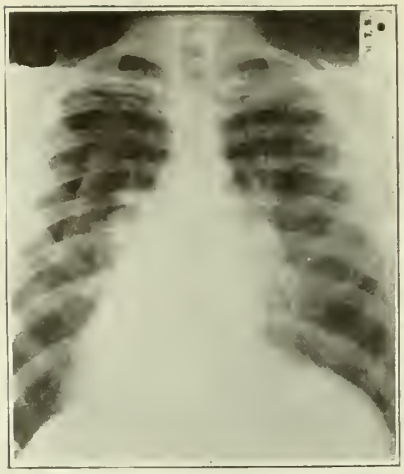


FIGURE 3

x-ray (see figure 3) shows the cardiac configuration of mitral-stenosis, and the usual findings of Chronic Passive Congestion. There is, in addition, considerable diffuse mottling throughout the lung parenchyma. The injection of 5 milligrams of Old Tuberculin gave no systemic or focal reaction. Diagnosis at discharge from the Municipal Tuberculosis Sanitarium was "No Active Tuberculosis," Mitral-stenosis with Chronic Passive Congestion of the lungs.

Case, L. B. Tailor. Male. Age, 50. Admitted to the Municipal Tuberculosis Sanitarium on several occasions because of repeated hemorrhages.

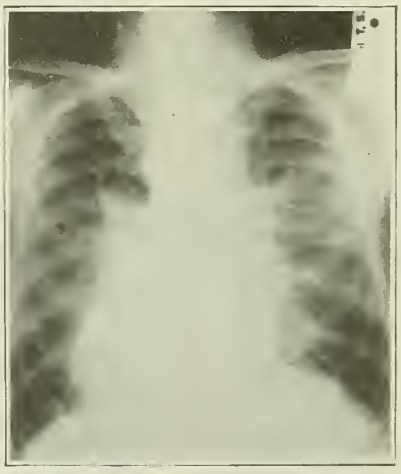


FIGURE 4

He was diagnosed as pulmonary tuberculosis by several different physicians because of the hemorrhages, and the marked increase in shadow densities on x-ray. Mantoux tests were negative in 1/1 dilutions and the subcutaneous injection of 100 milligrams of Old Tuberculin gave no systemic or focal reaction. His x-ray (see figure 4) in addition to the usual findings of a marked Passive Chronic Congestion of long standing, shows a typical falciform shadow indicating an Azygos Lobe.

Case, J. P. Chauffeur. Male. Age, 22. He complained of mild cough, expectoration and hemoptysis. Mitral-stenosis was present, and the x-ray shadows were similar to those shown. The Mantoux was negative in 1/1 dilutions, and the subcutaneous injection of 100 milligrams of Old Tuberculin gave no reaction.

Conclusions

1. Chronic Passive Congestion of the lungs is a definite clinical, as well as pathological entity. It should be considered in the differential diagnosis of pulmonary tuberculosis, along with Bronchiectasis, Pneumoconiosis and the other chronic non-specific inflammation of the lungs.

2. Chronic Passive Congestion of the lungs may simulate all the cardinal symptoms of tuberculosis and may present pulmonary hemorrhages of 50 or 60 grams.

3. We believe that these cases merit detailed study in order that these patients should not be labeled tuberculous and spend useless time and money going from specialist to specialist and sanitarium to sanitarium to the detriment of themselves, their families, and the institutions that care for them.

4. We also believe that the graded Mantoux used in connection with the subcutaneous injection of Old Tuberculin, is a very valuable and reliable aid in ruling out the presence of Pulmonary Tuberculosis, in these cases.

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The
JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA, *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

North Dakota State Medical Association
South Dakota State Medical Association
The Hennepin County Medical Society
The Minnesota Academy of Medicine
The Soo Railway Surgical Association
The Sioux Valley Medical Association
Great Northern Railway Surgeons' Assn.
American Student Health Association
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84 South Tenth Street, Minneapolis, Minnesota

W. A. Jones, M.D., 1859-1931 — W. L. Klein, 1851-1931

MINNEAPOLIS, MINN., SEPTEMBER 15, 1934

A WINNING FIGHT

The medical profession of Minnesota and, in fact, of the United States will be interested to learn from a recent report of Dr. Charles E. Cotton, Secretary of the Live Stock Sanitary Board of Minnesota and for many years Chairman of the Tuberculosis Committee of the American Veterinary Medical Association that the first tuberculin test has been administered to all of the cattle in Minnesota. Seventy-four of the eighty-seven counties in this state are now accredited; that is, the incidence of tuberculosis among the cattle population is 0.5 of 1 per cent or less. Seven other counties will probably be accredited by the end of October, 1934. It will be impossible to accredit the remaining six counties before June, 1935. The work has been somewhat handicapped by the drouth, which made it impossible to adhere strictly to quarantine provisions in some accredited counties, because large numbers of cattle from drouth-stricken counties were moved there for sustenance.

Dr. Cotton has met with much opposition and numerous difficulties as everyone does who comes forth with a vision and procedure that takes people from the well-beaten paths. He has met all of this opposition squarely and already has overcome his opponents because he understood the fundamental principles of tuberculosis control and his policies have always been sound. Dr. Cotton's guiding hand has been responsible in no small way for the accreditation of cattle herds of fourteen entire states and more than 50 per cent of all the counties in the United States. It is impossible to estimate the huge saving in these accredited areas. The farmer and the dairyman may now raise their cattle and dispose of dairy products with almost no loss as far as tuberculosis is concerned. Thus, a great economic victory has been won.

While Dr. Cotton has always appreciated the economic aspects of the campaign, he has had a burning desire to save the human family of this country from contamination with the bovine type of tubercle bacillus, which not only caused much crippling and deformity, as well as numerous deaths, but also prepared the way for the development of destructive pulmonary tuberculosis in later life. Thus, he and the group he represents have practically solved a great health problem. In fact, they have taken out of more than one-half of the counties of the country a great block of disease, so much so that now in these counties and fourteen whole states we no longer have enough cases of tuberculosis of the bovine type among human beings to teach the girls and boys in our schools of nursing and medicine what they really should know about this form of tuberculosis.

J. A. M.

PHILADELPHIA MEETING OF INTERSTATE ASSEMBLY

Attention is called to the first international assembly of the Inter-State Post Graduate Medical Association to be held east of the Alleghenies, at Philadelphia, November 5 to 9 inclusive.

Six of the participants in the program are from Rochester, Minn., two from San Francisco and one from St. Louis; it is otherwise, as might be expected under the circumstances, an offering of the best eastern talent. There will be some speakers from Canada and Europe. The meeting will take place in the public auditorium which being located in the University area across the street from the Philadelphia General Hospital, assures the assembly convenient access to the clinical material to be presented on the day preceding and after the meeting.

A carefully arranged program under the chairmanship of Dr. George W. Crile has been provided for all members in the profession who are in good standing in their State or Provincial Societies and desire to avail themselves of this opportunity of hearing distinguished teachers and clinicians. The County Medical Society of "the City of Brotherly Love" joins the Association in a cordial invitation to attend. A list of members who will take part in the program may be found in the last issue of the JOURNAL-LANCET.

A. E. H.

THE NEW DEAL AND STATE MEDICINE

In recent issues (JOURNAL-LANCET, August 1, 1934: State Medicine No Bogey Man and August 15, 1934: The Near-Relief Load in Medical Practice) we have discussed editorially the present status of State Medicine in the United States and the ominous trends in the direction of lay participation and control which now confront us. That this was no idle dream is now shown by the developments which have since occurred and which are summarized in the leading editorial of the Journal of the American Medical Association in its issue of August 25, 1934, entitled The Administration Studies Social Insurance. Here we find abundant confirmation of our fears. First, President Roosevelt has created "a committee of cabinet and other officials on Economic Security," headed by Miss Frances Perkins, Secretary of Labor, which committee has since appointed a technical board "to study the questions and to advise it in formulation legislation to the next Congress." A further "advisory commission" to be composed of "representative citizens from all parts of the country" is expected to be named by the President in the near future, according to Miss Perkins.

So far, the set-up thus outlined includes no representative of organized medicine; on the contrary, it does contain the name of one man whose views have been so sharply criticized by our Dr. Fishbein. This is Mr. Edgar Sydenstricker, of the staff of the Milbank Foundation and Dr. Fishbein, in the editorial just noted, meekly "wonders why he should have been among the first to be selected." We can offer a guess why—these Milbank people have been doing all the work and spending all the money in propaganda for this thing while we have been busy communing only with ourselves or possibly doubling for Nero with a cheap fiddle. We surely can't feel surprised.

Knowing well that no plan for social insurance can possibly escape the inclusion of medicine, Dr. Fishbein almost apologetically closes his editorial with these words: "It is to be hoped that the American medical profession merits enough recognition from our government to cause that government to seek its advice and its assistance in the development of these plans from the very first step in the consideration." How ingenuous. This in the face of the fact that the whole skeleton of the fabric of the machinery has been fashioned and assembled without as much as a conference with organized medicine, let alone the naming of one of its representatives in the personnel! All the recognition we have received so far is the receipt of an anonymous note telling us to be sure and eat plenty of nails so that we can be in shape to act as wet nurse for the little bastard when it arrives.

G. C.

MALPRACTICE

The Babylonians 4,000 years ago, according to the deciphered markings of that extraordinary stone found at Susa had a complete business code which among other rules and regulations prescribed fines for doctors who had the bad luck to "kill a slave by misjudgment."

In this modern era of social unrest and code remedies, the profession is confronted with the same problems and in greater complexity, not because judgment is more fallacious but the otherwise "unemployed" schemer is abetted by the modern "chiseler." And who forsooth is slave and who free in this code-bedecked age?

The medical profession is becoming aroused over the increase in malpractice suits and the resultant boost of premium rates for medical liability insurance. There is a tendency to call it

medical "liability" or "bond" rather than malpractice insurance because of the suggestive implication of the latter and this seems wise.

Students of modern medical trends are now delving into the matter. On the program of the Northern Minnesota Medical Association meeting at Brainerd this month, there were two addresses bearing upon the subject: The Cost of Medical Liability Insurance by Dr. B. J. Branton, Willmar, Minn., and Malpractice by Dr. W. H. Hengstler, St. Paul. The state association through its various councillors is sending out a questionaire to all members in an effort to determine the exact status and probable cause; and naturally it is hoped that they may find means of instituting a prompt remedial change. We shall have more to say upon this and related subjects from time to time as interest demands and information develops.

A. E. H.

NEWS ITEMS

Dr. W. A. Fansler, Minneapolis, is back at his offices after a short vacation at his Montana ranch.

Dr. J. H. Rishmiller, Minneapolis, has been spending the summer months at Alexandria, Minn.

Dr. Floyd M. Baldwin who was in active practice for many years at Redfield, S. D., died recently at his California home after a long illness.

Dr. R. S. Westaby, Madison, S. D., attended the annual meeting of the American Association of Railway Surgeons, held at Chicago last month.

Dr. Frederick H. Odendahl, who has been in active practice at St. Paul for over 40 years, died at his home last month, after an illness of only two weeks.

Many improvements are being made in the Musselshell Valley hospital at Roundup, Mont., which will increase the bed capacity which was sadly needed.

Dr. M. L. Spain, Davenport, Iowa, has moved to Hot Springs, S. D., where he will be on the staff of the Clinic of that city. Dr. Spain is a graduate of the St. Louis University.

Mrs. Dr. Martin Nordland, Minneapolis, president of the Women's Auxiliary to the Minnesota Medical Association has announced her committee appointments for the new terms as follows:

Dr. Patrick McCarthy, well-known Missoula, Mont., physician and surgeon, was instantly killed by the overturning of his automobile. Dr. McCarthy was 45 years of age and was born at Anaconda.

Dr. L. S. Jordan, Granite Falls, superintendent of the Riverside sanatorium, was elected president of the Minnesota State Sanatorium association at the annual meeting recently held in Cannon Falls, Minn.

Dr. F. H. Moss, who has been located at Osage, Iowa, has moved to Zumbrota, Minn., where he will be associated with Dr. G. O. Fortney. Dr. Moss is a graduate of the University of Minnesota.

The regular monthly meeting of the members of the Northwest Medical Society was held at the country club, Minot, N. D., with Dr. F. E. Wheelon being the host and serving a dinner of fried chicken and roast corn.

The East Central Medical Association were hosts to a large party of doctors at their August meeting held at Anoka, Minn., many of the physicians coming from a long distance to enjoy the banquet and program presented.

The Walman Optical Co., Minneapolis, have recently opened another branch office at Fargo, N. D., owing to their increased business from that section and their desire to give the physicians a better and more prompt service.

Dr. F. J. Savage, St. Paul, was the guest speaker at the last meeting of the members of the Olmsted-Houston-Filmore-Dodge County Medical Society at Rochester this month, his topic being, "The Work of the State Medical Association."

Dr. William R. Winn, Fargo, was elected president of the North Dakota Academy of Ophthalmology and Otolaryngology at its annual meeting in Fargo, recently. Drs. Charles N. Spratt, Minneapolis, and George M. Constans, Bismarck, were present as the guest speakers.

The Mayo Clinic were hosts to 240 French and Belgian physicians who visited the institution. The foreign physicians came here as a part of the post-convention tour following a meeting in Montreal of the North American French Speaking Physicians. After the Montreal meeting, the group visited the World's fair in Chicago before coming to Rochester.

The Richland County Medical Society held their delayed annual meeting at Wahpeton, N. D. last month and voted to hold regular monthly meetings throughout the year, the first one will be held on September 26. New officers were elected as follows: Dr. A. M. Thompson, Wahpeton, president; Dr. E. J. Beithon, Hankinson, vice president; Dr. J. H. Hoskins, Wahpeton, secretary-treasurer.

Coincidence, rather than any previous planning, governed in the choice of the same wedding day and hour by two well-known Minneapolis physicians and their fiancees. At one ceremony performed, Miss Marian Davis Jones became the bride of Dr. Edwin Grimshaw Benjamin, son of Dr. and Mrs. Arther E. Benjamin. In the other service, marriage vows were exchanged by Miss Helen Lucile Hassman of Hutchinson, Minn., and Dr. Erling S. Platou.

Mrs. S. S. Hesselgrave, St. Paul, chairman of finance; Mrs. William B. Roberts, Minneapolis, press and publicity; Mrs. J. O. McKeon, Montgomery, legislation; Mrs. A. M. Nicholson, Duluth, health education; Mrs. E. A. Eberlin, Glenwood, public relations; Mrs. H. B. Bailey, Fairmont, hygeia; Mrs. C. F. Ewing, Wheaton, editor; Mrs. J. B. Thabes, Sr., Brainerd, historian; Mrs. R. J. Josewski, Stillwater, resolutions; Mrs. W. J. Byrnes, Minneapolis, parliamentarian; Mrs. Fred A. Erb, Minneapolis, and Mrs. J. J. Ryan, St. Paul, social; Mrs. James Blake, Hopkins, Mrs. E. A. Meyerding, St. Paul, and Mrs. Benjamin D. Davis, Duluth, advisory.

Arrangements have been made through the Federal Relief Administration in North Dakota for the payment of dental and medical corrective care of children on the relief rolls under fourteen years of age; this in connection with each county committee, consisting in part of a medical physician and each county relief director; the medical rates to be based upon the North Dakota State Association's minimum fee schedule. Major operations not to be included. If hospitalization deemed necessary, the county commissioner must first authorize same. Under this plan, the children's parents may select their own physician.

Following an investigation conducted by the Minnesota State Board of Medical Examiners into repeated complaints that Mrs. Regina Krzan Dlugi, fifty-three years of age, was practicing medicine and healing without a license, a warning was issued to her to cease such practice, and to confine her work to that of midwifery. Mrs. Dlugi lives at Little Falls and while she holds a license from the State Board to practice midwifery, she has been selling roots and herbs and medicines of various types. In view of all the circumstances in the case, it was thought best that a warning be issued to this woman. Mrs. Dlugi was emphatically told that any violation of the medical act or the basic science law in the future would result in her being arrested and brought into court for trial. Mrs. Dlugi admitted having taken care of a number of persons without being licensed to do so, but stated that this was due to the necessity of her making a living. She was informed that that was no excuse for violating the medical act and the basic science law, and in a written statement which she signed, she promised that there would be no violation of these laws in the future.

CLASSIFIED ADVERTISEMENTS

PHYSICIAN WANTED

Good location for Scandinavian physician in Minnesota town of 400, large territory. Write to Box 1388, Fargo, N. D.

PHYSICIAN WANTED

A physician wanted to locate in one of the best Dairy Counties in Minnesota. Splendid opening. For full information, address Box 75 this office.

PHYSICIAN WANTED

to share suite of offices now occupied by established physician and dentist. Individual treatment room and laboratory. Located in new medical building in fine business and residential district. Address Box 76, care of this office.

FOR RENT

A very desirable location for physician or surgeon at Cedar Avenue and 42nd. Street, Minneapolis. Dentist office in connection. You can purchase complete office equipment if desired. Phone Drexel 1986 or write Box 77 this office.

POSITION WANTED

Experienced X-ray and laboratory technician desires position in hospital or clinic. Can combine work. Experienced in all departments, including office, record room, anesthetics, operating room, etc. Past year Superintendent. Willing to take charge of hospital or would consider starting a small general hospital, maternity hospital, or home for convalescents in suitable location. Address Box 74, care of this office.

The JOURNAL LANCET

Minneapolis, Minnesota
October 1, 1934

New Series
Vol. LIV, No. 19

Transactions of the Medical Association of Montana
Helena, Montana

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TRANSACTIONS OF THE MEDICAL ASSOCIATION OF MONTANA

1934

HELENA, MONTANA

The 56th annual meeting of the House of Delegates was addressed at Helena, on July 11, by President B. L. Pampel of Livingston. The following delegates presented credentials.

Cascade, Dr. F. L. Andrews, Dr. J. H. Irwin, Dr. F. L. McPhail, Dr. E. M. Porter; Eastern Montana Medical, Dr. M. G. Danskin, Glendive; Fergus, Dr. F. F. Attix, Lewistown; Gallatin, Dr. A. L. Brewer, Bozeman; Hill, Dr. L. T. Sussex, Havre; Mt. Powell, Dr. L. G. Dunlap, Anaconda; Musselshell, Dr. C. T. Pigot, Roundup; Park, Dr. S. E. Leard, Livingston; Silver Bow, Dr. R. C. Monahan, Dr. P. Potter, Dr. J. C. Shields, Butte; Western Montana Medical, Dr. J. D. Hobson, Missoula; Yellowstone, Dr. E. M. Farr, Dr. J. I. Wernham, Billings; President-elect Dr. C. E. K. Vidal, Galen; Past Presidents, Dr. W. F. Cogswell, Helena; Dr. G. M. Jennings, Missoula; Dr. J. R. E. Sievers, of Butte; Dr. E. N. Jones, of Wolf Point, Secretary of the newly formed Society in Northeastern Montana; Dr. L. H. Fligman, of Helena, President of the Lewis and Clark Medical Society.

There being no contests and a quorum present, the meeting was called to order.

Dr. M. G. Danskin, Glendive, moved that the minutes of the 1933 meeting, as printed in "Progress," be adopted. Seconded by Dr. Monahan. Carried.

In 1933 the Gallatin County Society asked for funds from the Medical Association of Montana to employ special counsel regarding violations of medical practice in Bozeman. This question was presented to the council in the February, 1934, meeting at which time the secretary was instructed to ask the legal opinion of Dr. W. C. Woodward of the A. M. A. The secretary then read Dr. Woodward's opinion. Dr. R. C. Monahan moved that a copy of this letter be mailed the Gallatin Society, and that they be asked to handle this affair without help from the Medical Association of Montana. Seconded, by Dr. Porter. Carried.

Dr. J. C. Shields, Butte, Chairman of the Committee on Contract Practice, read a resolution embodying the principles which the committee desires this Association to adopt. Dr. Jennings thought the resolution was not passed in the Anaconda meeting, but the committee was appointed to ask legal opinion and draft the resolution. Dr. Sievers said the idea was considered in the Anaconda meeting, the committee appointed, and the resolution to be written with legal help. At a committee meeting in Billings in May, ammendments were made which Dr. Shields then read. At the May meeting it was suggested that the secretary present a copy of this resolution with ammendments to Dr. W. C. Woodward of the A. M. A. for legal opinion. This opinion was then read. The subject was discussed by Drs. Shields, Sievers, Irwin, and Porter. Dr. Porter moved that the committee be continued and the resolution re-drafted conforming to the legal opinion of Dr. Woodward, and presented next year at the annual meeting. Seconded, by Dr. Danskin. The delegate, Dr. Pigot, was asked for remarks—in his opinion the Judicial Council of the A. M. A. and the Board of Trustees had promulgated plans covering this subject dividing contracts into ethical and unethical groups, which, if followed, would do away with the necessity for the Association to adopt a resolution on contract practice. Further discussion by Drs. Irwin, Attix, (who suggests that the county Medical Society handle its own contract practice problems) Andrews, Pigot, Shields. Carried.

Dr. C. T. Pigot, delegate to the Cleveland meeting of the A. M. A., presented his report and moved its adoption. Seconded, Dr. Shields. Carried.

Dr. J. C. Shields, Chairman of the Committee on Medical Relief, read a proposed agreement between the Montana Relief Commission and the Medical Association of Montana. (W. J. Marshal of Missoula entered) Dr. Porter moved that this committee proceed with its program and make the best arrangements possible with the Montana Relief Commission for one year. Seconded, Dr. Potter. Discussion by Drs. Leard and Shields. Carried.

The President appointed the following committees:

Auditing; Drs. Fligman, Dunlap, Sussex.

Nominations for the State Board of Health; Drs. Farr, Leard, McPhail.

Place of meeting for 1935; Drs. Irwin, Danskin, Wernham.

Request of Northeastern Montana Medical Society for a charter; Drs. Andrews, Porter, Brewer.

Consideration of the JOURNAL-LANCET as official publication; Drs. Dunlap, Hitchcock, Karsted.

Dr. Leard moved the meeting adjourn until Wednesday, 1 P. M. Seconded, Dr. Irwin. Carried.

E. G. Balsam,
Secretary-Treasurer.

Meeting of the House of Delegates, Wednesday, 1 P. M., called to order by President Pampel. The following delegates were present: Drs. Wernham, Andrews, Brewer, Danskin, Leard, Dunlap, Sussex, H. Hayward of Hamilton, A. T. Munro of Kalispell, and Dr. Bridenbaugh. Others present: Drs. F. L. Unmack, H. H. James, A. C. Knight, E. N. Jones, H. Smith, J. J. Malee, H. A. Bolton, and past presidents, Drs. Sievers, Donovan, Gans, Jennings, and Karsted. There being no contests, and a quorum present, the meeting was ready for business.

Dr. L. G. Dunlap read the treasurer's report and moved its adoption. Seconded. Dr. J. I. Wernham. Carried.

Dr. Wernham presented the report of the Committee on the Place of Meeting for 1935, which had selected Billings, and moved the adoption of the report. Seconded, Dr. J. L. Andrews. Dr. A. T. Munro asked that the meeting be held in Glacier Park. Dr. L. T. Sussex asked that the meeting be held in Havre. The motion was carried.

The report of the committee to which was referred the request for a charter by the Northeastern Montana Medical Society, was presented by Dr. Andrews who recommended that the charter be granted. Seconded, Dr. Dunlap, Carried.

The report of the committee which considered the request of the Journal-Lancet was presented by Dr. Dunlap who moved that the Journal-Lancet be made the official publication for the Medical Association of Montana for one year, and that the secretary pay one dollar per member per annum, where members are in groups only one subscription will be paid by the Association. Seconded, Dr. Munro, discussion, Drs. Malee, Dunlap, Brewer. Carried.

The report of the committee on Nominations for the State Board of Health was presented by Dr. Farr. The names of Drs. E. M. Porter of Great Falls, A. Karsted of Butte, E. A. Welden of Lewistown, W. S. Little of Kalispell, J. A. Evert of Glendive, were recommended. Dr. Brewer moved the adoption of the report. Seconded, Dr. Leard. Carried.

Dr. J. A. Donovan told about the wonderful services for the Association rendered by our delegate, Dr. C. T. Pigot, who has faithfully served the Association for many years, and recommended that in addition to railroad fare, fifty dollars be given the delegate for expenses. Dr. Dunlap moved that the delegate receive railroad fare and fifty dollars for attending the annual meeting of the A. M. A. Seconded, Dr. Danskin. Carried.

Dr. J. J. Malee stated that the physicians in some of the state institutions are practicing medicine outside of the respective institutions and asked that the House of Delegates take some action to stop such proceedings. Dr. F. L. Unmack said that Dr. Malee's statements were correct from his personal observations. Dr. Pampel suggested that the Mt. Powell Society settle the question and if it could not be handled satisfactorily that way, to refer it to the secretary of this Association.

Dr. Andrews moved the election be held in the General Assembly. Seconded, Dr. Wernham. Carried.

Dr. S. E. Leard moved the meeting adjourn until one P. M. Thursday. Seconded, Dr. Dunlap. Carried.

E. G. Balsam,
Secretary-Treasurer.

The House of Delegates was called to order Thursday at 1 P. M. by President Pampel. Delegates present: Drs. J. D. Hobson, A. T. Munro, E. M. Porter, E. M. Farr, F. L. Andrews, M. G. Danskin, J. H. Bridenbaugh, L. T. Sussex, S. A. Cooney, L. G. Dunlap, P. Potter; past presidents, A. Karsted, R. C. Monahan, J. A. Donovan; other members, T. L. Hawkins, R. H. Dyer, H. Smith, E. N. Jones.

At the request of Dr. Hitchcock, Chairman of the History Committee, Dr. T. L. Hawkins reported the work done so far by the committee, and asked that a thousand dollars more be granted for continuance of the work. Dr. Andrews moved that the report be adopted and that the matter be referred to the council. Seconded, Dr. Munro. Carried.

Dr. S. A. Cooney said that the present law required competitive bidding for the office of County Physician. In his opinion, that was improper and unfair, and he would like to have the state law amended to have the salary of the County Physician fixed according to the size of the county or to the amount of work done. Dr. Hobson moved that this subject be referred to the Legislative Committee for study and if deemed advisable to draft a law defining the duties of County Physician, and the remuneration for such work, and to try to have the new law adopted by the next legislature. Seconded,

Dr. Farr. Discussion by Drs. Dyer, Porter, Danskin, Andrews, Cooney. Carried.

Dr. Dunlap moved the meeting adjourn. Seconded, Dr. Hobson. Carried.

E. G. Balsam,
Secretary-Treasurer.

The 56th Annual Meeting of the Medical Association of Montana, in Helena, July 11, 1934. The meeting was called to order by President Pampel of Livingston.

Dr. L. H. Fligman, President of the Lewis and Clark Medical Society, welcomed the members to this meeting in Helena.

Dr. L. G. Dunlap of Anaconda responded for the Association.

The Secretary-Treasurer made the annual report.

In the absence of the vice-president, Dr. Fligman took the chair while the President gave the Annual Address, which dealt largely with the accomplishments of the year, and the economical questions which the profession faces.

Dr. J. Tate Mason of Seattle presented "The Healing of Chronic Ulcerations." Remarks were made by Dean Lewis.

Dr. W. A. Fansler of Minneapolis told about the "Surgical and Non-Surgical Treatment of Hemorrhoids."

The meeting adjourned.

Many of the members enjoyed luncheon with the Service Clubs of Helena.

The meeting was called to order by the President, Wednesday afternoon.

Dr. J. E. Benjamin of Cincinnati described "Sudden Death and a Consideration of its Mechanism." Discussion by Drs. Shanley, Malee, Schemm, Donovan, Sievers, and Benjamin.

Dean Lewis of Baltimore portrayed "The Essentials of a Physician."

Dr. M. G. Peterman of Milwaukee told about "Convulsions in Infancy and Childhood." Discussion by Drs. Gans, Wiesgerber, Joesting, Dyer, and Peterman.

At 7:30 in the evening, the annual banquet occured in the Placer Hotel. Dr. Shields read the agreement between the Montana Relief Commission and the Medical Association of Montana. Remarks were made by Director of Relief, Drs. W. J. Butler, J. J. Malee, P. Potter.

Thursday morning the meeting was called to order by President Pampel.

J. Tate Mason presented some phases of the "Gall Bladder Diseases." Discussion, Drs. Shanley, Benjamin, Emery, and Mason.

Dr. Benjamin gave some observations on "The Effect of Deep X-ray Treatment of Agranulocytosis, and the Clinical Effect of Amidopyrine."

Dean Lewis discussed the "Cancer Question."

Dr. W. A. Fansler told about "Cancer of the Colon."

Thursday afternoon the meeting was called to order by the President, Dr. Pampel.

Dr. M. G. Peterman described "Epilepsy in Childhood." Discussion by Drs. Joesting, Shanley, Gleason, and Peterman.

BUSINESS MEETING

The President called for nominations for *President-Elect.*

Dr. L. H. Fligman of Helena was nominated by Dr. E. M. Porter of Great Falls. Dr. George Barbour of Helena was nominated by Dr. D. T. Berg of Helena. Drs. Monahan and Dunlap were appointed tellers. There were twenty-nine ballots cast of which Dr. Fligman received twenty-two and Dr. Barbour seven. Dr. Fligman was declared President-Elect.

Vice-President—Dr. A. W. Morse of Butte was nominated by Dr. J. D. Hobson of Missoula who moved the nominations be closed, and that the secretary cast the unaminous ballot of the Association for Dr. Morse. Seconded, Dr. Sievers. Carried.

Secretary-Treasurer—Dr. E. G. Balsam was renominated by Dr. R. C. Monahan of Butte who moved the nominations be closed, and that the President cast the unaminous ballot of the Association for Dr. Balsam as secretary-treasurer. Second by Dr. Karsted. Carried.

Councilors—Dr. T. L. Hawkins of Helena, in place of Drs. L. H. Fligman; Dr. M. Smetters, of Butte; J. D. Hobson, Missoula, in place of Dr. A. M. Treat; L. G. Dunlap, Anaconda; L. T. Sussex, Havre, and E. N. Jones, Wolf Point were nominated by Dr. E. M. Gans who moved the nominations be closed and that the secretary cast the unaminous ballot of the Association. Seconded, Dr. Donovan. Carried.

Dr. J. A. Donovan thanked the Lewis and Clark Medical Society, the Placer Hotel, the Press, the service clubs, and all those who made this one of the outstanding meetings of the Association, for their courtesy and hospitality. He also congratulated the guests who presented the program for their fine talks, thanked them for coming to help make this meeting the great success it was, and invited them to return any time it was convenient for them to do so.

President Pampel asked past presidents Donovan and Sievers to escort President-elect Dr.

C. E. K. Vidal of Galen to the chair. Dr. Vidal thanked the members for having elevated him to the leadership of the profession in Montana, asked for their co-operation during the coming year, and promised to work faithfully for the betterment of the profession.

The secretary told the members that the House of Delegates had selected Billings as the place for the 1935 meeting. The JOURNAL-LANCET had been adopted as the official publication for the Association.

Vice-President Morse was called upon for a speech. He thanked the members for honoring him, and invited them to attend the meeting of the Pacific Coast Oto-Ophthalmologicial Society in Butte next week. As he is president of that Association, he assurred all of a warm welcome.

Dr. Sievers moved the meeting adjourn. Seconded, Dr. Gans. Carried.

E. G. BALSAM,
Secretary-Treasurer.

MEETING OF THE COUNCIL

Thursday afternoon in Helena. Meeting called to order by President Pampel. Those present were Drs. L. H. Fligman, A. W. Morse, L. G. Dunlap, L. T. Sussex, A. D. Brewer.

The action of the House of Delegates in voting fifty dollars for expenses to the delegate to the A. M. A. was presented by the secretary. Dr. Morse moved that the Association allow the delegate for attendance at the annual meeting, railroad fare and fifty dollars for expenses. Seconded, Dr. Fligman. Carried.

The House of Delegates voted that the History Committee be granted an additional thousand dollars to continue its work. Dr. Dunlap moved that the Association make available one thousand dollars for the History Committee for 1934-5. Seconded, Dr. Morse. Carried.

Dr. Fligman moved the meeting adjourn. Seconded, Dr. Dunlap. Carried.

E. G. BALSAM,
Secretary-Treasurer.

PRESIDENTIAL ADDRESS

B. L. Pampel, M.D., Livingston, Mont.

I know that I owe you a debt of gratitude that I cannot pay. You have given to me the highest honor that is in your power to bestow. Your gift to me is one of real friendship and good fellowship. Such acts touch the chords of one's heart and make it impossible to express in words the gratitude felt. All that I can say is that from the bottom of my heart I thank you.

The meeting of this society in Anaconda last year was an outstanding one in the matter of attendance as well as in the type of the program and of the entertainment provided. The scientific program maintained a reputation that the society can point to with pride. For a number of years we have had several physicians and surgeons of national prominence take part in our programs. These guests have paid their own expenses to come to us. Many of our own men have given us excellent papers and demonstrations—contributions that are of inestimable benefit to us. The stress of recent times has made it difficult, if not impossible, for many of our number to attend post-graduate courses. A comprehensive scientific program at these meetings is therefore very important. The state and the different county and district societies should feel it a duty to provide instructive programs insofar as they are able. Many of the medical societies, particularly in the larger cities of the state, have in the last two years featured diagnostic tumor clinics, orthopedic clinics, moving picture exhibits, and clinical demonstrations by noted physicians and surgeons from the medical centers of the country. This society should offer every possible encouragement to the continuation of such programs. During the past year district medical societies have been organized in the more sparsely settled counties of the state. The membership of these societies is made up, to a great extent, of recent graduates of Class A schools—men who have had hospital appointments and are keenly interested in their work.

This society is very fortunate to have a secretary who has for twenty years given freely of his efforts and time to the advancement of the organization. He has conserved wisely and carefully the funds of the society and he is in close contact with the membership. Through his extensive acquaintance with leaders in the profession we have obtained high class talent for our programs. His field of usefulness increases with his time in office. The same praise should be extended to our delegate to the A. M. A. who has for thirteen years been a willing and faithful servant to us. His time in office has made him a valuable representative. The executive services of Doctors Sievers, Garberson, Attix, Gans, Monahan, Jennings and others who have helped to build this society to what it is should be acknowledged with due gratitude. In this connection I wish to thank the members of the different appointive committees for their active service.

At our last annual meeting the discussion of the economic side of the practice of our profession was entered into with an ardor that the subject should evoke. We are coming to realize that this meeting is the place for the consideration of subjects vital to our existence. Heretofore we have drifted along serenely with the tide in our affairs taking what society felt like giving us. This complacent attitude has all but landed us in the center of a whirlpool of commercialism that should not exist. We have listened with curiosity rather than interest to the reports made by the council to investigate the cost of medical care. Neither the majority nor the minority reports meet with the approval of the rank and file of the profession. This investigation was an uncalled for and insidious attack on the standing of our profession—an effort to socialize medicine. We have always graciously and uncomplainingly given our services to the poor and we will continue to do so. Dominating industrial institutions seek to force other classes into socialism, yet they do not prescribe that medicine for themselves. No complaint has ever been offered because the medical profession very singularly is required to devote its greatest energies to the destruction of its own market. But the profession will strenuously oppose any effort to control its relations with the sick through a bureauocracy. Commercializing the profession lowers its standing; removes every incentive to advance and excel; makes a trade out of a profession; and substitutes mass production for scientifically applied therapy. Competitive bidding and cut-rate bargaining will not relieve suffering nor salvage lives. The flaw in these socialistic schemes is that they take no account of the loss of efficiency due to removal of the incentive of individual advantage. The medical profession expects not only to hold onto the attainments already made in its scientific developments in the care of the sick and injured but to continue to advance in the fight against disease, and thereby to insure to every individual, regardless of class, the very best treatment possible. This service cannot be had if the natural incentives to advance are removed.

Through an organized effort on the part of the medical profession the number of medical colleges in this country has been reduced from 165 in 1890 to 76 in 1932. The medical course has been raised to four years with one or two years of hospital experience. The degree, M.D., now means more to suffering humanity than it ever did. Through the activities of such societies as the American College of Surgeons and the American College of Physicians the hospitals of the country have been standardized and the high ideals of graduates have been safeguarded. The average life expectant age has been raised from 47 years to 59 years through the scientific attainments of the medical profession. Despite such wonderful achievements the profession has not a united organization to deal with the government, the industries, the insurance societies and the medical schools.

At the present time a large number of our clientele are indigent patients who are under the care of the federal relief. In many of the counties the relief committees have not allocated funds for medical care with the result that relief patients are being cared for gratuitously by the doctors of these localities. Deductions of from 15 to 40 per cent below the minimum charge have been offered to the physicians for services to the relief patients. This arrangement, while not entirely satisfactory to the physicians, would be acceptable if the county committees would pay for professional services as they do for food and clothing furnished to the patients.

The regularly licensed physicians have a right to expect that World War veterans should be treated by them in local hospitals and that they should be paid by the federal government for the service. Congress should see that Uncle Sam takes the M.D. off his door. War veterans are being cared for at distant federal hospitals when the service required could be rendered fully as well by nearby civilian physicians at a great financial saving to the government. The excessive building of governmental hospitals for veterans at a time when private hospitals were also being erected with little regard to actual demand has lead to a decline in receipts until many hospitals have for some time been operating at a constantly increasing deficit. This condition has brought about a movement toward insurance schemes with a promise to remedy the loss. These schemes have gone so far as to include medical and surgical service in the contract. The insurance idea is to be feared even more by the public than by the practitioners for the patient deals primarily with the hospital, an institution owned and controlled by a board of laymen who seek to make physiological and pathological conditions harmonize with schedules of bills receivable. A discrimination is often made between physicians employed to the extent that the physician who places the lowest price on his services is the one chosen for the position. Contract practice adopted by large industries has placed a premium on cheap pro-

fessional services. Many positions of this kind are filled by recent graduates who take the job for the actual experience gained thereby. Commensurate remuneration is being given little consideration. About forty-eight per cent of all actively practicing physicians in the United States are engaged in some type of contract practice.

In our country it is estimated that we have one physician to every 780 persons while England has one physician to every 1,500 people, France one to 1,700 and Sweden one to every 2,890 people. A conservative estimate of the American physician's contribution in services rendered to charity patients is approximately one million dollars a day. Do you know of a trade, art or other profession that is doing so much? According to a compilation of figures there is at present a surplus of at least 30,000 physicians in the United States, and there are at least 20,000 more who are not making a living by the practice of their profession. The training of more medical students than is needed undermines the foundation of sound medical practice and violates economic law. If we continue to raise the standards of medical practice as we intend we should insure a decent living to the physicians who practice. This is possible only by cutting down the number of graduates to the needs of the population; not regulating that number by the ambitions of our medical colleges. Reducing the number of medical colleges by more than half is to no good purpose if those remaining are engaged in movements of expansion requiring more money to build greater clinics to accommodate more students that still greater clinics may be built to provide even larger numbers of students, so that these students must enter an already overcrowded professional field.

In well directed efforts to further the interests of preventive medicine, boards of health are closely encroaching upon the field of medical practice. The dividing line between preventive and curative medicine should be drawn so that no contention may arise between the physician and the health officer. Curative medicine presupposes a knowledge of pathology and diagnosis. Health nurses and technicians do not have this knowledge and therefore should not enter the field of curative medicine.

The medical profession has leaned over backwards, so to speak, to be fair and unprejudiced in dealing with the cults who in turn are violating the medical practice act. It should be a duty of our profession to see that the several provisions of the medical practice act are rigidly enforced for enforcement means competent treatment to the public. Superstitions and false beliefs of one kind and another regarding diseases are so deeply grounded in the mind of the average individual that nothing short of legislative control will make him protect his own life and the lives of his family.

The broadcasting of health programs practiced by many of the state medical societies is made use of to educate the general public about the quacks, the cults and the vendors of advertised medicines. This information comes to the public through such media as the radio, the newspapers and the speakers bureaus. Window displays, literature, motion pictures, and even plays, pageants and parades are featured in many localities by the aggressive medical societies. Emphasis is being placed upon the relation of the individual to his doctor and upon the indiscriminate use of drugs. Yet the sum total of all this campaign is but a fractional part of one per cent when compared to the newspaper publications and radio broadcasting by advertising propagandists who are selling potent and often times dangerous drugs that are exploited to an ignorant and gullible public for no other purpose than the profit made upon the sales. These concerns are so strong financially that any effort that the medical profession and the ethical pharmaceutical houses could make to regulate the safe and sane use of drugs by the general public would be killed before it could receive any legislative consideration. The disposition of the Copeland-Tugwell bill is a fit illustration of this condition.

It is evident that from every corner of the field the practice of medicine is being restricted. Industrial and insurance companies are dictating to their subjects the doctors and hospitals they may use, and the doctors in this service are paid by a board of directors whose foremost duty is to curtail expenses. Governmental agencies are in active competition with the profession in caring for governmental employees and war veterans. Health boards have taken over preventive medicine. Advertising firms are allowed to load the people with cure-alls of every character. Subjects of charity are receiving gratituitous care from the physicians of the country. Medical colleges are graduating more doctors than can possibly live by practicing their chosen profession.

Our organizations, the county, the state and the American Medical Association have accomplished a great deal in the advancement of the profession so far as its ethics and scientific attainments are concerned but there is still lacking the recognition of the fact that our very existence is being undermined by unseen forces that intend to dominate the practice of medicine. It is necessary that we

come out of our present condition and start some movement to get our backs away from the wall. The "Let George do it" idea gets us nothing. The activities of our different medical societies accomplish very little unless there is an individual effort back of every movement to reach some goal. To overcome unfavorable legislation the individual can accomplish more than the society, but the efforts of individuals should be directed by an organization. If every one of us would make it his individual business to thoroughly acquaint his own representative in the legislature with our position we should have no fears of losing our professional status. Without this individual and co-operative effort we cannot expect to successfully oppose these movements. Whether we are to be permitted to continue to exist as free members of a great profession or are to become mere cogs in the machinery of state medicine depends upon our willingness as individuals to play the game.

These are matters worthy of your most profound and careful consideration. If we carry on the torch of medical progress so nobly handed to us by our ancestors, it is necessary that we now give heed to the question of medical economics.

To the Members of the Medical Association of Montana

Your delegate to the American Medical Association begs to report as follows:

The eighty-fifth annual session of the A. M. A. held at Cleveland, June 11-15, was the fourth largest in point of attendance. Registration totalled 6,293, of which Montana registered nine. The scientific and commercial exhibits are constantly increasing in size and value, and the system of housing all parts of the convention in one building adds immeasurably to convenience and comfort.

In his presidential address, Dean Lewis stated: "I have visited many societies and I find that the profession is troubled." The accuracy of his observation was confirmed by the fact that practically all the deliberations of the House of Delegates dealt with problems of an economic nature. Quoting Dean Lewis again: "We must preserve the idea that medicine is a profession and not a business, if we are to maintain quality of medical service. We must all concede that anyone practicing medicine should be able to make a living and I am sorry to say that not infrequently the higher the ideal and the squarer the methods, the less the living. As a result of the depression, doctors have had a bad time financially and they may easily be exploited by lay people, both in hospital and in health insurance. We should remember that it is easy to say that the people are not getting sufficient medical care, but how shall it be provided? Those who practice medicine are always being told how to do it, but those who criticize them have usually had no experience in doing it and couldn't do it at all if called on to do so. We have the right to be proud of our achievements, and we can best meet every challenge directed at us by carrying on without fear and with vision."

President-elect Bierring states: "There are those without our association who would speak with authority and much concern of our welfare regarding the solving of these problems. While we gladly listen for guidance from every available source, we are confident and deeply conscious of our ability to put our own house in order."

Dr. Bierring sees two great problems facing the medical profession:

1. Each year more physicians are being graduated than present society can adequately support. Preparatory steps are being taken to work out a solution of this problem through restriction of the output of medical schools.

2. The second problem is concerned with the changing order of medical practice. It is sad to relate that mighty forces have been at work to sow the seeds of discontent in the ranks of organized medicine and to destroy the faith in that leadership which is based on the sacred traditions of sacrifice and devotion to the idealism of medical service.

There is no doubt but that great and fundamental changes in the system of medical service are in the offing. Into what form they will ultimately resolve themselves is uncertain. No one can as yet say whether it will be state medicine, sickness, and hospital insurance or what. The fact remains that the leaders of American medicine are fully alive to the situation and the House of Delegates this year laid down a set of basic rules defining the attitude of the American Medical Association towards any system of group medicine. These rules are as follows:

The twelve principles governing the field of medical practice are:

1. All features of medical service must be under the control of the profession.

2. No third party will be permitted to come between patient and doctor.

3. Patients must have absolutely free choice of physicians.

4. Confidential and permanent relationship between patient and doctor is fundamental.

5. All medical phases of institutional service must be under professional control.

6. Immediate cost of service must be borne by the patient able to pay at time of service.

7. Medical service must have no connection with any cash benefits.

8. Any form of medical service must include all qualified physicians of the locality willing to serve.

9. Systems for the relief of the poor must be limited strictly to those below the "comfort level" standard of income.

10. Restrictions on treatment or prescription must be formulated and enforced by the organized medical profession.

11. The individual savings principle, by which the person having no need of assistance would not be required to bear too much of the burden of those who make extensive use of the service, should be considered.

12. There should be no commercial solicitation of members.

This platform of organized medicine might be summarized as follows: We have made American medicine the best in the world by our methods and we consider it our business to regulate what we have built up.

The medical profession is indeed troubled as evidenced by the number of resolutions dealing with economic questions introduced in the House. As a matter of fact, much of the time of the Delegates was spent in consideration of these problems. The two outstanding lay foundations are spending much money and effort in the spread of propaganda urging new methods of medical practice. The comparatively small reduction in the membership of the A. M. A. shows that in spite of conditions, doctors are continuing in that association to which they look for a solution of their problems. The action of the Board of Regents of the American College of Surgeons in advocating a plan of hospital insurance brought from the A. M. A. a very short rejoiner to the effect that the A. M. A. represented the medical profession of the United States and that no comparatively small specialists organization was in any way qualified to speak for the varying interests and ideas of the profession as a whole.

An executive session was held to consider a resolution from the State Association of Michigan and a statement of the Board of Trustees, both concerning sickness insurance in the United States. A special committee appointed to study and report on these two communications, reported, briefly, as follows:

1. No European system of health insurance conforms to the four fundamental principles.
   A. Free choice of physician by insured.
   B. Limitation of benefits to those of medical service.
   C. The control of medical service benefits by the profession.
   D. The exclusion of individuals or organizations that might engage in health insurance for profit.

The committee believed that these principles are basically sound and should be included within any further study of medical service to be adopted as the policy of organized medicine.

It reviewed the stand which the House of Delegates has taken practically yearly from 1916 in opposing any plan of state medicine or compulsory health insurance.

In 1933, the House of Delegates unanimously approved in principle the minority report of the Committee on Costs of Medical Care and urged the A. M. A. to disseminate this point of view among the profession and the public with a view to the maintenance of high ethical standards and the preservation of professional ideals. Today, we are confronted with an extraordinary situation of the utmost importance to the health and welfare of the American people and to the American medical profession. A considerable number of foreign nations have already established state systems of medical care and an intensive campaign has been carried on in this country for years led by philanthropists, social workers, economists, and various foundations to cause the American medical profession and the American people to accept a similar type of medical practice.

It is also now well known that the President of the United States has come forth for the principle of social insurance with special reference to old age pensions and unemployment insurance. In 1930, the House of Delegates recommended the establishment of a Bureau of Medical Economics for the study of these problems as they affect the medical profession. The Bureau has issued two valuable publications dealing with state medicine and compulsory insurance. These two should be studied carefully by every physician. They are the April Bulletin of the A. M. A., and sickness insurance problems in the United States.

There are manifestations of unrest among some of the component bodies of the association as evidenced by communications urging a change in the activities of the organization, which would in effect, demand a departure from the policies set down by the House of Delegates during the past eighteen years.

The committee did not recommend any plan, but laid down the twelve points heretofore enumerated and suggested that they be followed by all constituent bodies of the A. M. A. as basis for the conduct of any social experiments that may be contemplated by them. If it is determined in a community that some experiment to change or improve the method of administering medical service is desirable, observance of these principles will remove many of the disturbing influences from such an experiment. In all such experiments, attention must be sharply focused on the quality of medical service. Such restrictions will undoubtedly lower the enthusiasm of many of the present advocates of such schemes. They remove the interest of the politician, the commercial promoter, and those others who are seeking to achieve other objectives than better medical care for those unable to provide such care for themselves under present conditions.

All these principles are directed towards protecting the character of the service to be given, and all are directly designed to guard against abuses which experience shows are found to arise when these principles are neglected. In most communities it will be found that comparatively few changes in the methods of administering medical care will be necessary. That type of medical practice which preserves the personal relationship between physician and patient, that maintains the practice of medicine as a profession, and that has withstood the test of centuries must be preserved for the best interests of both the public and the medical profession. The report of the special committee was adopted.

The report of the Committee on Legislative Activities stated the attitude of the A. M. A. in regard to veterans legislation. Briefly the main points are:

1. Opposition to continued building of hospitals for veterans with non-service connected disabilities. The need of veterans hospitals for care of nervous and mental diseases and advanced tuberculosis is conceded.

2. Insistence that those non-connected cases financially able to care for themselves should be treated at home by their home physicians.

3. The A. M. A. has consistently taken the position that the Federal Government ought not to provide medical nursing and hospital services for veterans, who are able to provide such services for themselves for injuries and diseases in no way related to military service.

The law, as passed over the President's veto, limited hospitalization to those who are willing to make oath as to their inability to pay for medical care. We should oppose a loose construction of this section as otherwise the purpose of the law will be defeated and much harm come to the practicing physician. It discontinued money payments to hospitalized veterans.

In Illinois, a medical commission, composed of district, county, and post surgeons of the Illinois Department, American Legion, acts as advisers to the Rehabilitation Committee in the interests of ex-service men. It's great success has been in improving this service while preserving the worthwhile ideals of the medical profession. It is worthy of close study.

The legislative committee is convinced that if the medical men throughout the country would become interested in the candidacy of those who, regardless of party, hold views in harmony with our profession, it would not be long until we would have in Congress a very positive influence. This applies equally to our State Legislature.

General hospitals show an average of 155,000 unoccupied beds and special hospitals an average of 61,754 unoccupied beds in 1933. This is forceful testimony of the effects of the depression as well as of excessive hospital facilities. It is recommended that not only state relief commissions but county administrations as well should have physicians in their personnel.

Some resolutions introduced and disposition made of them are:

1. Dealing with practice of hospitals paying radiologists salaries, fees going to hospitals. Referred to Committee on Medical Education and Hospitals.

2. Opposing the exploitation of drugs, remedies, etc., over the radio. Carried.

3. Requesting appointment of a committee to contact leaders of organized labor in anticipation of social insurance. Such legislation is certain to be introduced in next Congress. "Organized labor" deleted and "all intrusted" groups substituted.

4. Limiting physicians on staff of hospitals approved for internships to members of component county medical societies. Approved.

5. Opposing the administration of anaesthetics by any one except a licensed physician or dentist. Referred to Committee on Medical Education and Hospitals for further study.

6. Barring from the practice of radiology all persons not licensed to practice medicine. Approved.

7. Resolutions dealing with contraceptives and birth control were tabled.

8. A resolution registering disapproval of

employment of optometrists by hospitals was carried.

9. A resolution was presented by the Medical Society of the District of Columbia protesting against the giving of free medical and hospital service to senators, congressmen, cabinet officers, and other high officials, to employees of bureaus and departments, their families, domestic servants and other employees all at public expense. The practice was declared unfair to the taxpaying public and to the medical profession. State associations are urged to endeavor to influence their representatives in Congress that the evil may be done away with.

10. Resolution concerning publicity by clinics, hospitals, sanatariums, and other semi-public medical institutions. Investigation of ethical practices of institutions. Approved. Procedure outlined.

Dean Lewis urged the substitution of expert boards for expert witnesses. State societies and bar associations should co-operate to this end. The Principles of Ethics were amended to make it unethical for a physician to sell his services to a lay corporation, which resells the services at a profit.

James S. McLester, of Birmingham, Alabama, was elected president-elect by a small margin over Hugh S. Cumming, of Washington, D. C.

Geo. G. Reinle, Oakland, Calif., was named vice-president.

Olin West, Chicago, was the unanimous choice for secretary.

The very efficient speaker, F. C. Warnshins, was unanimously re-elected.

The 1935 meeting will be held at Atlantic City, and probably will be a joint scientific session with the Canadian Medical Association.

Your association was recognized by the appointment of your delegate to the reference committee on medical economics.

Respectfully submitted,

C. T. Pigot, M.D.,
Delegate to A .M. A.

Carcinoma of the Large Bowel*

W. A. Fansler, M.D.†
Minneapolis

DURING the past fifteen years there have been revolutionary changes in our conception of carcinoma of the large bowel. These changes have come so rapidly that it might be well to attempt to briefly correlate our present information, so it may be of the greatest practical value. With this in mind, I shall give my personal interpretation of the subject with certain suggestions which I think are of value.

As to the etiology of this condition, we know as little or as much as in the case of carcinoma elsewhere. We do know that areas of maximum irritation seem to be more prone to develop malignant changes. These areas occur in the bowel at the flexures, or at the points of narrowing. This is particularly true of the rectosigmoid juncture, which is the most common site of cancer of the large bowel. One point of definite knowledge is the fact that carcinomas of the large bowel frequently develop from adenomas. In form they may be either pedunculated or flat and button-like. The pedunculated type are likely to remain benign for a long period of time, and not infrequently never become malignant, but terminate as a benign fibrous polyp. On the other hand, the flat type are more likely to become malignant at an early stage, or even be malignant from their earliest inception. Within the last year I have seen two small flat lesions, approximately one-half centimeter in diameter, which upon removal, were found to be adenocarcinomas. While small pedunculated growths may show malignant change, even large ones are often removed which are still entirely benign. On the other hand, I have never seen a flat lesion more than 1¼ centimeter in diameter which did not show carcinomatous changes. However, either type of these tumors should be considered as a precancerous lesion and removed as soon as discovered.

Cancer is usually considered a disease of middle or later life, but one should not be confused or lulled into a sense of false security by the age of the patient. A case has been reported in a child under two years of age, and numerous cases have occurred in persons under twenty years of age. Statistics show that one per cent of all cases occur in persons under thirty, three per cent between the ages of thirty and thirty-nine, 18 per cent between forty and forty-nine, 31 per cent between fifty and fifty-nine, and 39 per cent between sixty and sixty-nine. The remaining eight per cent occurring in those over seventy. As to location of growth, 60 per cent occur in the rectum and rectosigmoid, the remaining 40 per cent are distributed: six per cent in the cecum, five per cent in the ascending colon, three per cent at the hepatic flexure, three per cent in the transverse colon, three per cent at the splenic flexure, five per cent in the descending colon, 14.5 per cent in the sigmoid, .5 per cent in the anus. These statistics as to location have certain significance as to the type of symptoms presented, as to the operability and mortality, but perhaps the greatest significance lies in the fact that 60 per cent of all growths of the large bowel can be felt by digital examination.

There is considerable variation in the characteristics of these growths and their degree of malignancy. The first type is the soft medullary fungating type which frequently has a large pedicle. This growth occurs most often in the cecum or ascending colon, and is relatively less malignant in character. These tumors and the so-called mucoid carcinoma, are doubtless variations of the same type. The second, or scirrhous type of growth is as the name indicates, harder and contains more fibrous tissue. Dividing this group still further, we have first the small sclerosing napkin ring type. This tumor is small in size, contains a rather dense scar tissue in proportion to the carcinomatous cells present. It surrounds and gradually constricts the bowel by the contraction of fibrous tissue in the stroma of the growth. With this type of lesion, complete or almost complete obstruction, is often the first symptom which impels the patient to seek his physician. Its origin is usually in a flat button-like lesion. The second cancer of the scirrhous group is the so-called poliferating or cauliflower type. This tumor is often quite large in size and contains relatively less fibrous tissue in proportion to carcinomatous cells than the type just described. It protrudes into the lumen of the bowel and also penetrates the bowel wall by invading downward through its pedicle. The portion of the tumor protruding into the

*Read before the Medical Association of Montana, Helena, Mont., July 12, 1934.

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lumen of the bowel is cauliflower-like in appearance. Its projections appear brittle, are friable, secrete mucus, and bleed freely following slight traumatization. This type of tumor is common both in the distal half of the colon and in the rectum. It has characteristics midway between the soft medullary and napkin ring types of growth. The third type cancer is the invasive or serpiginous type which occurs most frequently in the rectum and rectosigmoid. This tumor begins as a small button-like elevation in the mucocsa and gradually extends around the bowel by invading its walls. Ulceration occurs early—usually near the center of the growth. The tumor remains flat with a crater-like ulceration and eventually completely encircles the bowel. It does not, however, produce constriction as the napkin ring type of growth occurring in the colon. This type of tumor is usually more malignant and metastasizes earlier than those previously described. There is no question but that there are varying degrees of malignancy, even in tumors of the same type. As a basis of general understanding, Broders has divided this variation into four grades. The grade is determined by the amount of differention of the cancer cells from the embryonic type, the number of mitotic figures, and other evidence of cell activity. This is a very interesting and valuable classification, but I have not felt that preoperative grading of the malignancy of a tumor is as important in determining the type of operation to be done, as the presence or absence of metastasis. If metastases are found, other than a few enlarged glands adjacent to the tumor, radical operation is seldom indicated, regardless of the grade of malignancy. On the other hand, if no metastases, or only a few glands are present, I feel justified in doing as radical operation as possible, regardless of degree of malignancy. It is true that the chance of recurrence is more likely where a high grade of malignancy exists, but it should not materially influence operative procedure. If the tumor and all macroscopic metastases can be removed, I think it should always be done.

The diagnosis of carcinoma of the colon or rectum is based upon the symptoms presented, and upon digital, instrumental and X-ray examinations. In considering symptoms, they may be said to fall into three groups—those which occur in the very early cases, those which occur in the moderately advanced lesions, and those which indicate far advanced and inoperable lesions. Unfortunately the symptoms with which the medical profession are most familiar, are those of inoperable cases. The stressing of these, which after all are obvious and valueless, has deterred us from investigating those symptoms which while more uncertain and less pathogomonic, are much more important since they may indicate an operable lesion.

If symptoms are present in early carcinoma, they are usually those of bowel irritation. Occasionally there may be macroscopic blood in an early lesion, but this is rare. More often these symptoms consist of vague abdominal uneasiness, slight twinges of transient dicomfort, perhaps slight cramping, due to hypermotility, an unusual amount of gas, an occasion frequency of stool, or a slight area of tenderness. In other words, these patients have vague abdominal symptoms which cause some annoyance, but from the point of diagnosis, may mean most anything. The very fact that these symptoms are commonplace have caused us to ignore them or at least not connect them with malignant disease. If we are to classify these symptoms, I would say that they are those which exist in cases of the so-called irritable bowel. The importance of these symptoms does not lie in their character, but in their persistence. Symptoms of this type which do not yield to simple medical measures, should always put a physician on his guard. Every patient with persistent symptoms of kind type is entitled to a most thorough and painstaking examination. I say thorough and painstaking for if a tumor is present, the chances are it is a small lesion, and hence more difficult to demonstrate than a more advanced one. Only by strict adherence to this plan will early cases be discovered.

Of the symptoms of moderately advanced lesions, the most frequent are the passage of blood, or bloody mucus and definite change in bowel function. This change of function may manifest itself in the form of mild constipation, or an increased frequency of stool. Occasionally definite abdominal cramps or sudden urge to evacuate the bowel, is a symptom at this time. Certain variation of these symptoms may indicate the segment of the bowel involved, but the important thing to realize is that these symptoms point to definite changes of a gross nature and that a considerable percentage of patients presenting these symptoms, actually have well developed cancer. Unfortunately the patient frequently does not consult his physician when these symptoms first appear. He attributes them to "colitis," piles, or "intestinal flu," and often loses months of valuable time. By this time symptoms such as loss of weight, anemia, weakness, obstruction, the presence of a tumor mass, have become manifest. These symptoms always mean an advanced lesion and frequently mean inoperability. It is of vital

importance that patients be educated to consult their physician the moment symptoms appear.

An examination in cases of suspected carcinoma should proceed along regular lines. Insofar as the rectum is concerned, digital and proctoscopic examinations are the best methods and are all that is necessary. Almost all rectal malignancies can be felt, and all can be seen by proctoscopic examination. On the other hand, except in advanced lesions, X-ray is very likely not to show the tumor. With the rectum thoroughly evacuated the patient is requested to bear down, and the finger is then carefully swept around the entire bowel circumference. Even a tumor in the rectosigmoid will usually be invaginated down within reach of the finger when the patient strains. The proctoscope is then inserted and the entire rectal surface carefully inspected. Where there is no large tumor which is easily palpated or seen, particular care should be taken to look behind the valves of Houston, as a small growth may easily be overlooked in this location. Sometimes when the rectum and rectosigmoid present no abnormality, mucus and blood may be seen coming down from the bowel beyond the end of the proctoscope. If so, this is of great significance. I prefer to always make a preliminary proctoscopic examination without the patient having taken a cathartic or enema as they may have removed valuable evidence of bowel change. In all cases where digital and proctoscopic examinations do not reveal a lesion sufficient to account for all the symptoms present, the remainder of the large bowel should be carefully investigated. For lesions above the reach of the proctoscope, the X-ray is the best, and in fact the only reasonably reliable method of examination. To be of real value I feel the X-ray studies must be made with proper equipment and by someone especially trained in Roengenology. A poorly done X-ray is a handicap rather than a help for one may be given a sense of false security by relying upon a faulty report. In the case of large lesions an error is unlikely, but in small lesions the most careful technique is necessary. Unfortunately it is in the diagnosis of these small lesions which are difficult to visualize that we are most dependent upon the X-ray. A definite routine should be followed, and it might not be amiss to briefly outline it here. The bowel is thoroughly evacuated by the use of castor oil or saline cathartics and plain water enemas. The barium which should always be given as an enema, is injected into the bowel and a fleuroscopis study made. Following this plates are taken. In case of gross lesions this may be sufficient. If doubt exists, the barium is then evacuated and a second series of plates taken. The colon is now inflated with air using a small rubber bulb, and a third study made including plates. This last method, the so-called areogram, is by all odds the best method of demonstrating small tumors. I have repeatedly had single small polypoid lesions no more than a centimeter in diameter, demonstrated by X-ray plate taken in this manner. If only a small lesion is found it is well to repeat the study to be sure that the defect remains constant in size and position, for small fecal particles may become coated with barium and present the appearance of small polypoid tumors. Assuming that the X-ray and physical findings are negative, if symptoms persist after suitable treatment, especially if small amounts of blood are present, the question of an exploratory operation should receive serious consideration. At first thought this seems to be a radical suggestion, but I think this feeling is simply due to the fact that surgeons as a group have not been in the habit of exploring for colonic lesions. It is surely of greater importance to the patient that his abdomen be explored to clear up the diagnosis of a suspected carcinoma, than to have it explored on suspicion that a chronically infected gall bladder or appendix may be present, yet surgeons frequently explore for the latter lesions but seldom for the former. Exploratory operation should never be done without careful consideration, but in this case I feel the surgeons in general have been too conservative.

Operability of these cases insofar as hope of radical cure is concerned, varies at the present time from 50 to 60 per cent. The chief hope of increasing the ratio of operability is by earlier diagnosis. The factors which influence operability and the type of operation selected, are primarily the question of metastasis, degree of obstruction, fixation and size of growth, infection, invasion of adjacent structures, the general condition of the patient, and to a limited extent, the grade of malignancy. Extensive metastases are usually thought to preclude the idea of removing the primary growth, yet where it can be removed without too grave an operative risk, it is sometimes desirable. This is true where it is thought that the removal of the primary growth may make the patient more comfortable and free from pain than if the tumor mass was allowed to remain and invade adjacent structures. Direct invasion by a primary tumor is often the cause of much suffering, while death from metastases, other than those of the spine, are frequently quite painless. Obstruction is also a very important factor in deciding upon a plan of operative procedure. Where present it should always be relieved before the

tumor itself is attacked. Medical means may suffice in the milder grades of obstruction, or it may be possible in the case of lesions of the rectum or rectosigmoid, to pass a catheter by the growth and irrigate the bowel. Where no other means suffice the obstruction should be relieved surgically by some form of enterostomy proximal to the tumor. The size and fixation of the growth may not be important, for a very large growth may have no metastases and its size and fixation may be due to inflammatory processes rather than actual tumor development. Diversion of the fecal current and deep X-ray therapy will often materially reduce the size and increase mobility of the tumor. In the case of actual abscess formation, local drainage should be a preliminary step. The general condition of the patient should receive careful consideration. Radical operation means a severe surgical procedure. Seventy-eight per cent of these patients are past fifty years of age, and 47 per cent are beyond sixty. Hence they are more likely to have physical impairments and to recuperate less readily than younger persons.

The length of this paper does not permit one to discuss all the factors of the patient's general health. It should be pointed out, however, that this is extremely important and that a careful examination is necessary. This should include complete laboratory findings as well as a thorough physical examination. If physical impairments are recognized, frequently the patient can by careful preparation, be brought to a point where surgery is relatively safe, while without preparation surgery would most surely be fatal. If the patient presents impairments which cannot be satisfactorily relieved, we must be content with less radical procedures.

While there is considerable variation in the operative care of these patients, it should be kept in mind that to obtain the best results, surgical procedures should be of the most radical type compatible with a reasonable operative risk. Successful cancer surgery must always be radical surgery, and these cases offer no exception to this rule. In the colon fundamentally, the operative question resolves itself into deciding between a one-stage procedure or a multiple-stage operation, and between an anastomosing type or Mikulwicz type of operation. In general multiple-stage procedures are safer than single stage, though in patients where there is no obstruction, whose physical condition is good and the mechanical problem not too difficult, single-stage operation may be indicated. If obstruction is present, a one-stage procedure should never be employed. This is one dictum from which there should be no variation. In cancer of the right half of the colon an anastomosis of the ileum with the transverse colon is the best procedure. The cecum and entire right half of the colon may then be removed at the same time the anastomosis is done, or this procedure may be left until two or three weeks later. If the entire operation is done in one stage, a catheter should be inlaid into the ileum to take care of gas pressure. In cancer without obstruction in the left half of the colon where the growth can be adequately freed and brought out through the abdominal wall, a Rankin three-bladed clamp is applied at points proximal and distal to the growth and the intervening segment of gut and tumor are removed with cautery. When the clamp is removed forty-eight to seventy-eight hours later, a double barrelled stoma similar to that following the classical Mikulwicz is left and is dealt with in a similar manner. In some cases this type of operation is not desirable because the bowel cannot be sufficiently freed, or because there may be glands involved which cannot be adequately resected by this method. In cases where the tumor exists in a portion of the bowel which is completely invested with peritoneum, which has an adequate blood supply, which can be freely mobilized, and has no infection present, anastomosis is often desirable. An end to end anastomosis eliminates the necessity of later closure and shortens the patient's stay in the hospital. In cases where the patient has a short mesentery, where the tumor is large and necrotic, where edema and infection are present, anastomosis should never be attempted. A few extra days or even weeks in the hospital should not influence the surgeon to ever employ a less safe procedure.

In cases of carcinoma of the rectum we are confronted with several operative possibilities but if we are to do sufficiently radical surgery a colostomy is usually necessary. This is the hardest condition to get the patient to accept, but it is the price he must pay for having an adequate removal of the growth. Once accepted and properly cared for a colostomy is not a severe handicap. Occasionally we may have to defer to the patient's wishes in this respect, but it should be only after every means of persuasion have been exhausted, and we are sure the patient thoroughly understands the great additional risk of recurrence he is taking by refusing the colostomy. As to choice of operation for removing the growth, I believe in the hands of an experienced operator and with the patient in good condition, the one-stage abdomino-perineal operation is by all odds the best method. This permits the most radical removal of the growth and adjacent tissues, together with

the gland-bearing area, including the glands of the rectosigmoid. No time is lost between stages during which metastasis may occur; the procedure is complete in one operation and hospitalization is reduced to three or four weeks. The second choice is that of the two-stage abdomino-perineal procedure as done by Lahay, D. F. Jones, Barlett and Rankin. These methods apply, as nearly as possible, the radical features of the one-stage abdomino-perineal method to a two-stage procedure. In patients who are under average risks these methods are the best. A preliminary colostomy carries a relatively small mortality compared to the operation for the removal of the carcinoma. It short circuits the fecal current, eliminates trauma to the tumor, and relieves obstruction, if present. During the period of time elapsing between the formation of colostomy and the second operation for the removal of the growth, it is possible to greatly improve the patient's general condition. For this reason he can much better withstand the major operation for removing the tumor, than if it were done as a primary measure. For lesions very low in the rectum, or in case metastases are present but it is thought desirable to remove the growth, a simple colostomy followed by posterior resection is indicated. It is a less radical procedure and does not permit the removal of as much gland-bearing area, and for this reason should not be used routinely. Local removal of the growth is theoretically never justifiable, though an exception may be occasionally made in the case of minute lesions. Palliative measures in inoperable cases consist of colostomy which may be followed by cauterization of the tumor with low heat or the use of radium. Personally, I have not been particularly impressed with the results obtained by radium in rectal malignancies. In far advanced lesions its use causes severe suffering without prolonging life, and in early cases I ordinarily see no occasion to apply radium to a lesion which can be thoroughly removed surgically. In case where some physical defect precludes the removal of even a small lesion surgically, radium is definitely indicated.

The mortality rate in bowel malignancies depends primarily upon the percentage of cases accepted for radical operation, the skill and experience of the individual surgeon and the amount of attention given to preoperative preparation and postoperative care. Obviously if a surgeon accepts only the best risks, he will have a low mortality rate, but he will probably save less lives in the end, than if he had accepted a greater group for operation, and had a higher mortaity. Considering 60 per cent of the cases seen as suitable for radical operation, a mortality rate of from 10 to 15 per cent is not excessive. Immediate postoperative death is rare nowadays. Death usually results from later complications, and the most common of these are peritonitis, pneumonia, obstruction, sepsis, urinary conditions and cardiac failure. These complications cannot always be prevented, but I am sure that careful preoperative and postoperative care are most important in reducing their occurrence. The present-day reduction in mortality rate is due in my opinion much more to these factors than any betterment of operative technique.

The most important consideration to the patient is the chance of cure. If we consider five years as a permanent cure, a little less than half of the patients will survive. These percentages vary somewhat with the location of the growth. The cecum shows the largest group of cures—50 per cent, the colon 48 per cent, sigmoid 40 per cent, rectum and rectosigmoid 40 per cent, anus 42 per cent. These results are not as good as one would like, but if we consider that we are dealing with a condition, which without operation is 100 per cent fatal, we have reason for greater satisfaction. Even though a patient is not cured, he may expect a more comfortable existence and a prolongation of life.

It may be that a good many men in this audience will never care to operate upon a case of carcinoma of the colon or rectum, but even so, your responsibility as to the fate of these patients is still greater than that of the operating surgeon. The further reduction of operative mortality and increased chances of permanent cure lie almost entirely in earlier diagnosis of these cases. No surgeon can operate only on late cases and hope for a low mortality rate or a high percentage of cures. The earlier diagnosis of these lesions must be based upon the education of the public and the alertness of the patient's regular medical attendant. In this public education the patient's own physician can do more than anyone else. In the past the symptoms of far advanced or inoperable carcinoma have been too strongly emphasized and the symptoms which may indicate the presence of an operable lesion, ignored. People should be taught that the passage of blood from the bowel, irregularity or change in bowel function means carcinoma until proved otherwise. On the part of the physician he must not lightly disregard symptoms of this kind, for if he does the patient will do likewise. No patient should ever be dismissed with a suppository or other palliative treatment without digital and proctoscopic examination.

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Osteochondritis in Adolescence and Its Relation to Trauma*

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THERE are two objectives in presenting this paper—first a plea for a simplified terminology of the various diseases involving the epiphyses of childhood and adolescence and second, to show if possible any relationship between these conditions and direct trauma.

One glance at the list of various diseases of the epiphyses and the confusion of terms, with even the various men's names applied in controversy, is sufficient to instigate a plea for clarifying the terminology.

The varieties of conditions affecting the epiphyses as listed by one authority (Babcock) is sufficient to bring this point definitely home. The following is the outline given by this author:

Epiphysitis (Osteo-Chondritis)

Varieties—

1. Osteochondritis deformans juvenilis coxae (Legg-Calve-Perthe).
2. Epiphysitis of the tibial tubercle (Osgood-Schlatter's Disease).
3. Epiphysitis of the tarsal scaphoid (Kohler's Disease).
4. Epiphysitis of the head of the second metatarsal also called (Kohler's Disease).
5. Vertebral Epiphysitis (Schlatter's Disease).
6. Epiphysitis of the Os Calcis.
7. Epiphysitis of the Olecranon.
8. Epiphysitis of the various epiphyses of the ileum.
9. Malacia of the semilunar bone.
10. Osteochondritis Dissecans (King).

A careful survey of the literature including the original articles fail to reveal any definitely proven etiology of these various conditions which for simplicity will be termed "Osteochondritis." Practically every organism has been investigated as a possible cause, various deficiencies in diets have been advanced and direct trauma—none of which have been definitely proven as positive factors. The most enlightening works so far on the etiology of osteochondritis has been that of Harbin, Zollinger and Pickett. These authors have been able to biopsy affected areas and thereby study the pathological picture. These investigators have been frank enough to describe their findings not having sufficient evidence to definitely determine the etiology. Many interpretations might be made from the pathology present, such as lack of blood supply and conversely over vascularization, cartilaginous necrosis and degeneration. All summed up we are still in the dark as to the cause of these diseases of the epiphyses, however, it seems to be very definite that there is no material difference between the pathological changes occurring in the different epiphyses of the body.

The term "Osteochondritis" applied appears logical for the present in contradiction to epiphysitis as the pathological change is not one solely of the epiphyses, but also involves the shaft and cancellous bone adjacent.

There is no material difference in the pathological picture presented in Osgood-Schlatter's Disease and Legg's Disease. While symptoms vary in the changes occurring in the various epiphyses, these result from peculiarities such as weight bearing, non-weight bearing and amount of stress applied from tendon attachment. In spite of this so many similarities of these various diseases present themselves that they constitute formidable evidence that they are all one disease with one entity, with a common cause, differing only as their anatomical positions dictate.

The roentgenological picture is essentially the same whether it be the os calcis, the vertebra, the metatarsus or the tibial tuberosity. They may vary in detail, but have common characteristics of fragmentation, rarefaction and irregularities of outline with distortion. All of these conditions arise during a period of ossification and are all spontaneously cured at the age of epiphyseal union.

Rarely does the condition affect a non-weight bearing epiphyseal line such as the shoulder, elbow or the hand and while this statement is generally true, I may appear to contradict myself in later showing that trauma is not the underlying cause of this condition, in that some cases are definitely generalized in character.

The condition does not occur in adults, although a careful analysis of structural deformities of adult life will definitely lead to the conclusion that osteochondritis is a much more prevalent disease than is commonly thought.

The treatment of osteochondritis with our pres-

*Read before the Great Northern Railway Surgeons' Association at Glacier Park, Mont., June 29, 1934.

ent lack of knowledge of the etiology is limited to the prevention of structural defects, the disease cures itself spontaneously at the age of ossification.

The simple term of osteochondritis anatomically designating the epiphysis involved or epiphyses and when generalized so termed is presented with the view of clearing the confusion basing the term on its pathological picture. While it is commendable to award due recognition to investigators, first pointing out these diseases, it should not be practiced to the point of permanently confusing the nomenclature.

Trauma as a direct cause may be discarded by taking a careful history. While many patients will give a definite injury episode, careful questioning will usually bring out the fact that it was not a more severe injury than many times experienced by them and usually the injury will have been sought for after the condition has been apparent, not infrequently found with some difficulty, not unlike the prenatal cause of birthmark.

That injury such as has been attributed to osteochondritis of the os calcis is caused by jumping is not well founded. Were this the case it would be almost universal in boys. Undue strain on the quadriceps tendon as the cause of osteochondritis of the tibial tuberosity is likewise illogical rather the separation occurring is the result of the pathological change occurring in the epiphyseal line permitting this.

Osteochondritis of the vertebral bodies is usually a part of a generalized osteochondritis and in no cases which we have treated or read about has there been any evidence of trauma having been a factor. Most of these cases occur in patients subject to osteochondritis of the capital epiphysis of the femur. These cases as a rule are in markedly overweight, often fat adolescents and brings to mind the possibility of the overweight being of the same cause as the osteochondritis. In other words the osteochondritis and the obesity being allied symptoms of a possible glandular or nutritional disturbance.

The cases of generalized osteochondritis very definitely speak for themselves as evidence against trauma as an etiological factor in this condition.

The diagnosis of osteochondritis can be definitely made from the roentgenograms. In osteochondritis of the vertebra, it is absolutely essential that lateral views be taken. Many cases will be entirely overlooked if this procedure is neglected. Every X-ray department should have a chart of ossification and union hanging on its walls. The best chart to my knowledge is that presented by Drs. Camp and Cilley of the Mayo Clinic.

Conclusion

A plea is made to substitute the term osteochondritis for the various types of epiphysitis frequently described to clarify the confusion of ambiguous terms and investigators' names.

Trauma as a cause of osteochondritis can be definitely ruled out if it is at all a factor, it is only to the extent that it is exciting to the underlying pathology.

CARCINOMA OF THE LARGE BOWEL

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Sixty per cent of all cancers of the large bowel occur in the rectum or rectosigmoid and can be actually seen or felt. It may not be possible to have routine X-ray examinations for every patient having slight colonic disturbances, but at least they should never be omitted in any case where symptoms persist after usual medical treatment, even though the patient must go elsewhere to have them done.

In closing then I wish to simply say that the future progress in the cure of bowel cancer lies chiefly in earlier diagnosis, and that this can be accomplished only by increased alertness on the part of the physician, and the education of his patients as to earlier symptoms which may mean cancer.

Treatment of Supra-Condylar Fractures*

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AS AN introduction, I want to mention a few anatomical details of the lower extremity of the Humerus. The lower extremity of the humerus is flattened from before backward and broadened out laterally, and it is slightly curved forward. The two articular surfaces, the Trochlea and the Capetellum make a pronounced curve forward. The inner condyle is more prominent than the external, and is at a lower level. The entire lower extremity of the Humerus is cartilagenous in childhood. It is blended with the shaft; but does not become united by osseus union before the 18th year. The anterior and posterior ligaments are attached closely above the Cornoid and Olecranon Fossae. The external ligament is attached to the external Condyle, and the internal to the internal Condyle. The Radial nerve divides in front of the Capitellum into the Deep and the Superficial branch. The Radial is the nerve that is most often injured in Supra-Condylar fractures. The Ulnar nerve lies in a groove behind the Internal Condyle.

The displacement in Supra-Condylar fractures depends on the direction of the force that produced the fracture, but it is most often backward. The patient will hold the arm in pronation and slightly flexed, and then there is a marked swelling behind the elbow joint.

The method of reduction is to place the forearm in supination and, holding the forearm with left hand, placing the right hand behind the elbow, pulling the lower segment down away from the fracture surface of the shaft. Then hyperflexing the forearm on the Humerus so the hand will rest on the shoulder. And, after having ascertained that the segments are in correct alinement, then allowing the muscles to pull the fractured surfaces together. X-rays must be taken to see that there is no lateral displacement, and that the reduction is correct. Then strapping the hand with Z. O. strips to the shoulder and applying a light and rather loose cast. With this method the reduction is easily made and there is no pain after the fourth day.

August 13, 1931, a railroad employee was brought to me with a comminuted Supra-Condylar fracture of the right Humerus. I reduced the fracture and applied a cast with the arm flexed half way between right angle and acute flexion. I sent X-ray and report to Dr. Webb. Dr. Webb sent me instructions to place the arm in acute flexion. The arm was kept in acute flexion. A cast was applied for two weeks. After two weeks the arm was carried in a sling. Extension was commenced four weeks after the injury. I explained carefully to the patient how to work the arm, and that extension was to be obtained by himself alone, and that he should not accept any assistance from any friend who might want to assist him. He carried weights and pulled on heavy objects, as well as worked the arm backward and forward. The patient returned to work on the section November 1, two and a half months after the injury. All movements are normal, and, to notice any difference in the two arms, it is necessary to bare both arms, and it then can be noticed that the arm that was fractured lacks a trifle of full extension.

On May 27, 1932, a nine-year-old boy was brought to me with a Supra-Condylar fracture and posterior displacement. Reduction was made by placing arm in supination and hyperflexion. Hand was strapped to shoulder and a light cast applied. After five days the hand was left loose, and he was encouraged to move his fingers and wrist. After four weeks I attempted extension by moving the arm a trifle. I found by X-ray that moving the arm at this time would separate the lower segment from the shaft. The arm was left in hyperflexion five and a half weeks. That it took a longer time to get firm union with a child than an adult I attributed to the fact that the epiphysis in childhood is cartilagenous and only blended with the shaft, so that a firm bony union can not be attained in childhood. After having kept the arm in hyperflexion for so long a time, extension was more difficult, and the boy could not make much progress until he was set to rowing and swimming when the arm straightened very rapidly. He now has all the normal movements and only lacks a trifle of full extension.

I believe that an anesthetic is not necessary for the reduction of this kind of fracture. Pain is produced by allowing the fractured surfaces to

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*Read before the Great Northern Railway Surgeons' Association at Glacier Park, Mont., June 30, 1934.

The Principles Involved in the Treatment of Osteomyelitis and Compound Fractures*

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Lincoln, Neb.

MR. PRESIDENT, Members of the Association, and Guests:

The invitation to speak before your association is appreciated all the more because of the fact that I have already had the pleasure of speaking to a few of the members of this association at a meeting here at Mitchell some years ago. At that time I made some remarks in regard to the method of treatment in chronic osteomyelitis which I have been advocating now for about a dozen years. Today I am going to ask you to give me your attention on a phase of the subject to which I have not often referred—that is to say, I am going to ask you to consider not the things I do in my method of treatment of chronic osteomyelitis and in dealing with the osteomyelitis that is associated with compound fractures, but to consider rather the reasons why those things are done. It has been one of the mistakes, I think, of the antiseptic method that too often we have adopted a technical method advocated by someone without asking whether or not there were any real reasons why the details of that technique should or should not be carried out. It has been my opinion that various antiseptic methods have been adopted and employed over long periods which are in direct violation of definite and well-known principles of surgical treatment in fractures, osteomyelitis, and other infected wounds.

May I ask you to refer back to the main points of the treatment which I have been employing in these conditions. The items of treatment upon which I insist are (1) a clean-up of the wound and the adjacent territory; (2) surgical operation with the wound packed open for adequate drainage; (3) protection of the wound and the parts against subsequent injury by movement, muscle spasm or by dressings, and protection of the wound and the patient against secondary injury to the wound surface, to the injured part, and against introduction of new infection. In any change of dressing, or disturbance of splints or plaster of Paris cast for irrigations and the like there is sure to be an intrusion into the wound by instruments, dressings, surgeons' fingers, or other foreign disturbing agencies commonly employed in connection with such post-operative care.

Now these details of treatment that I have urged upon the profession rest upon certain fundamental principles which cannot safely be violated in the course of surgical treatment. It has been demonstrated in previous surgical history by John Hunter, John Hilton, Hugh Owen Thomas and even by Sir Joseph Lister himself, that rest and protection of the wound and the patient are of fundamental importance. This can be done by splinting and correct post-operative care and by the exclusion of infection by proper dressings. These and certain other details are essential to the promotion of healing. It has often been emphasized that one of our first duties is the protection of the patient against original, repeated, or mixed infection, and that we should assist in his recovery in the shortest possible time with a minimum of disability and deformity. It is a compliance with these fundamental principles which I have been endeavoring to insist upon in proposing the treatment which I have outlined.

In order to refresh your memory, I have prepared lantern slides giving the details of the method that I employ so that they will be clear in your mind. This outline is presented for consideration at this time with the principles I have just described in mind.

This is the form presented at the Societe Internationale de Chirurgie Orthopedique in London, July, 1933.

The Orr Method in Osteomyelitis, Compound Fractures and Other Infections

(It is important to observe that the method devised by Dr. H. Winnett Orr in 1921-1922 and first published in 1923, consists not only of infrequent dressings with aseptic [not antiseptic] vaselin gauze packs but of an adequate drainage operation when required, immobilization to prevent trauma during and following operation and prolonged protection of the patient against irritative motion, muscle spasm, secondary wound infection and deformity. It is the combination of these factors and not the use of any one or two that constitutes the Orr Method.)

*Read before the South Dakota State Medical Association, Mitchell, S. D., May 16, 1934.

Outline

1. For open infected fracture patients or those requiring surgical operation, immobilize patient on operating table at once in traction and in best position possible. (Special fracture table preferred.)
2. Do a thorough debridement or drainage operation if necessary.
3. Pack entire wound open with sterile vaselin gauze using no sutures or drainage tubes.
4. Apply an extensive well fitting plaster of Paris cast.
5. Do not change dressing or disturb the cast, the wound, the dressings, or the injured part except for definite complications.

THE METHOD IN DETAIL

1. Preliminary

(a) Secure best position of the injured limb possible by traction and careful manipulation.
(b) Use the simplest and least possible number of movements in reducing fractures or in correcting deformities.
(c) Employ moleskin traction, pins, or ice tongs, if necessary, and include traction and fixation devices in the cast to maintain length and correct position.
(d) Do not again move or manipulate inflamed or injured parts during or following the operation.

2. The Operation

(a) Prepare skin with Tr. iodin and alcohol. Make an incision or opening that will thoroughly uncover (saucerize) the infected area.
(b Remove as much foreign material and dead or dying tissue as possible.
(c) Do not curet or damage healing and protective portions of the wound cavity. No attempt is to be made to remove all diseased or infected tissue.
(d) Do not remove bony or soft parts that may contribute to repair.
(e) Wipe out with iodin and alcohol just as the skin was prepared in order to give a clean field for the dressing.

3. The Closure

(a) Fill cavity with a vaselin gauze pack from the depths to the surface of the wound. Pack gently but firmly.
(b) Use no drainage tubes or other mechanical irritants in the wound.
(c) Use no chemical as a dressing at any time.
(d) Do not suture or cover any infected area with flaps of muscle, fascia, or skin.
(e) Cover the entire wound area with a dry, sterile, absorbent pad to take up drainage at the edges of the vaselin pad.

4. The Splint

(a) Maintain the length and position already obtained and immobilize the affected part in such a manner that no muscle spasm or contracture can occur.
(b) Plaster of Paris, well fitting and extensive, has been found to be most satisfactory as an immobilizing device. Its efficiency has been greatly improved by the plan following.
(c) Moleskin adhesive straps or skeletal fixation devices are to be included in the cast when necessary so as to insure fixed traction, control of fracture fragments and comfort for the patient.

5. The Dressing

(a) Plaster of Paris casts are applied with sufficient padding so that they are not to be fenestrated or split. In this way the temptation to inspect or dress the wound is also prevented.
(b) Secondary dressings are to be deferred for several weeks, but when done, should be done in the operating room and aseptically.
(c) The injured part is not to be moved nor the wound surface to be damaged.
(d) Do not hesitate to employ anaesthetics for secondary dressing.
(e) Make late dressings as infrequent as early ones.

Beginning with the time when the patient is first operated upon, when the first attempt is made to deal with his infected osteomyelitis area or his compound fracture, consideration is given to the point that nothing shall be added either to his injury or to his infection. The patient is put upon the operating table with the parts carefully adjusted in as nearly correct position as possible and he is fixed with the injured parts in correct length and position before any surgical treatment is begun. This having been accomplished, the operation may then be carried out with all the parts under control in correct position until the final traction splint or cast has been put on. After the manipulation, operation, or debridement, adequate drainage is left by means of the vaselin pack whether there is an active suppurative infection or whether the infection is recent; introduced at the time of injury. The wound is cleaned out mechanically and by means of iodin, and then

filled with the vaselin pack which not only provides protection for the wound surface against the entrance of new foreign material but affords adequate drainage around the edges at the same time.

After the above, the plaster of Paris dressing is put on in such a way as to maintain the position that has been obtained. This control may be facilitated by the introduction of steel pins so as to give skeletal fixation in the cast, or when that is not necessary, moleskin traction will suffice. Then the patient is put to bed and there is no further dressing or disturbance of the injured or inflamed parts *or of the patient* for a number of weeks.

If the program is carried out in exactly this way we find that the patient remains remarkably free from post-operative pain and other difficulties and from complications or infection.

When any program of treatment is faithfully followed with the above principles in mind, minor questions or difficulties will solve themselves. That is to say, we do not have to concern ourselves as to whether we shall use this or that chemical antiseptic in the preparation of the skin or in the few dressings that are done. We do not have to ask ourselves about rubber drainage tubes or frequent dressings as we know that they violate the principles of such surgical treatment. Even if one is disturbed by suggestions about maggot treatment or bacteriophage, it is easy to conclude that these suggestions belong in the same category with hundreds of others that have been made and are open to the same objections as any other active frequent dressing or antiseptic treatment.

The maggot treatment represents simply a partial reduction of the amount of damage done by ordinary daily dressings. The maggots themselves can have no possible influence upon the healing of wounds or even upon the cleaning up of wounds. The relatively infrequent dressings with maggots and the discontinuance of chemicals for daily dressings are the only points that can be considered to be advantageous in the maggot method. These are points that I had been contending for for a long time before maggots were suggested.

The same may be said with reference to the use of bacteriophage—one need not concern himself about what takes place in the wound itself as long as the wound surface or the patient are not disturbed. If it is true that bacteriophage is present and assists in the solution of those organisms that lie between the wound and the dressings, that is so much to the good, but it is not the main point either in the surgeon's care of the patient or in the patient's recovery.

In other words, if we content ourselves with providing adequate drainage, rest for the wound and the patient, protection of the patient against secondary infection, and preventing the deformity and disability that may be caused by muscle spasm or irritative motion, we have done the best that we can to contribute to his recovery in the shortest possible time and to protect him against disability and crippling in his final result.

Those are the points to which I invite your attention with the idea that the fundamental principles that apply to the care of such a patient should always be borne in mind and should govern us in selecting and carrying out our treatment.

TREATMENT OF SUPRA-CONDYLAR FRACTURES

(Continued from Page 621)

rub together. If the lower segment is pulled away from the fractured surface of the shaft, reduction can be accomplished without pain. The advantage of not using an anesthetic is that one can have the co-operation of the patient, and more time can be taken so as not to be in any hurry, and every precaution taken to see that the reduction is correct.

The Triceps and Biceps muscles with Corronoid and olecranon processes form a perfect splint.

With hyperflexion the tip of the olecranon process is pulled in front of the Trochlea. If extension is attempted by pumphandling, the olecranon is only worked against the anterior convex surface of Trochlea. Extension must be accomplished by pulling so as to lift the olecranon over the convex surface of the Trochlea. Rowing is one of the best exercises to accomplish this.

Even with hyperflexion the bone does not heal with the natural curve forward. In other words, the bone, after healing, is too straight. It is by extension that the bone is molded so that the Trochlea will fit into the Sigmoid cavity and the bone having the natural curve forward.

The JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA, *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

North Dakota State Medical Association
South Dakota State Medical Association
Montana State Medical Association
The Hennepin County Medical Society
The Minnesota Academy of Medicine
The Sioux Valley Medical Association
Great Northern Railway Surgeons' Assn.
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M. E. Herz, *Business Manager*
84 South Tenth Street, Minneapolis, Minnesota
W. L. Klein, 1851-1931

MINNEAPOLIS, MINN., OCTOBER 1, 1934

MONTANA OFFICIALLY WITH US

It was voted at the Helena meeting of the Medical Association of Montana to make the JOURNAL-LANCET the official publication of the Association and that the secretary pay for membership subscriptions.

We congratulate the association on the step taken. Every association needs a medium through which the membership may keep in touch with its activities, read the transactions and items of news of a local character and which they can point to as their own representative organ.

That the early medical history of Montana is of unusual interest was evidenced by papers and discussions at the annual meeting at Bozeman in 1931. Unfortunately that history was not complete because of the lack of permanent records in some instances of the past. This was keenly felt by some of the members and was doubtless an important factor prompting the move this year. Cato observed he would much rather posterity should ask why no statues were erected to him than why they were and that is the question we would ask about these pioneer giants of the Montana hills.

We are publishing this years transactions of the association in this number of the JOURNAL-LANCET for the perusal of those who attended as well as those who were unable to be present at the Helena meeting. Additional papers will appear in subsequent issues. Montana is still writing medical history, writing it with the golden pen of the twentieth century enlightenment; and we predict that even greater interest will some day be manifested in the records of today than for the sagas of the past, partly because of that greater enlightenment, greater present activity and because of the possibilities of a more permanent record through the printed page.

We are naturally pleased at having received this commission to aid the association through our twice-a-month messenger and pledge our best efforts to serve the members. Incidentally we might suggest that a few good editorials from this rocky mountain state would be appreciated by their prairie dwelling neighbors as well as the members of ye editorial board. They have tried to make this a good journal. North and South Dakota have contributed to its success which Montana now assures. Here's a hearty welcome to participate with us in these efforts for the good of all.

A. E. H.

MIGRAINE VS. ESSENTIAL HYPERTENSION

Brown and Adson* of the Mayo Clinic have recently reported upon bilateral supralumbar anterior nerve root section, to sympathectomize relatively gross areas of the body. This was done successfully to check devastating organic changes (eyeground, brain, kidney) occurring in individuals with hyperspastic peripheral arterioles, by

*Brown, G. E.; Adson, A. W.: Effect of Sympathectomy on Severe Forms of Essential Hypertension. Read before the Minnesota State Medical Association meeting in Duluth, July 16, 1934.

interrupting the pathways between the peripheral vessels and a hyper-reacting vasomotor brain center. For the purpose of this editorial I ask, for the present, that this objective evidence of overaction of the vasomotor mechanism be accepted as the hereditary propensity behind the physiologic perversion known in its full cycle of development as "hypertensive disease." Let us ignore for the present later modifications which time may dictate. For the present it offers much food for thought.

Whatever the "conditioning" may be in migraine, little doubt exists either as to its hereditary features or the likelihood that it involves some vascular supply fluctuations. We may well compare these two common afflictions.

Migraine may well prolong life; because it enforces upon the individual in his prime, careful hours, abstemiousness and foresight. Hypertension may well shorten life; because in the fruitful years the subject withholds neither his powers nor his propensities.

The "run of the mill" migrainer has a far more sensitive, shrinking and self effacing personality, than the driving, forceful, dynamic hypertensive. The one bemoans his affliction even less than his capacity to "spoil the party"; the other knows no useless fatigue, pays no penalties as he goes on and condemns all aesthetic leads and avocations as fit only for recluses. Finally, the one rides into life's twilight and suddenly the vision stabilizes, the stomach turbulence fades, the painfully acquired habits of retreat remain fixed—he lives in the glow of a sustained comfort, his weight proportionate to his years. Need I describe the hypertensive, dogged with an ambition that bewails every multiplying abridgement—whether of wind or of vocational outlook. The aesthetic trails which intrigued him so little in youth lead him even less to relaxation or peaceful reverie.

Neither type deserves more than passing praise or condemnation. Many exceptions abound; but life seems to average up if it is allowed to run toward the biblical allotment. This might possibly cheer up the asthenic migrainer and induce the hypersthenic hypertensive to study the technique of relaxation. E. L. T.

MUTUALISM IN MEDICINE

There is a certain relationship among the lowest organisms, perhaps best illustrated in the case of lichen which is the product of the symbiotic growth of fungi and algae, that may be applied to illustrate the interdependence of the various branches of medical service.

In symbiosis, we have the intimate association of two living organisms neither male and female, parent and offspring nor host and parasite and yet each is dependent upon the other for its very existence. In lichens, the fungus symbiont supplies the nitrogen and the alga commensal the carbohydrate, both of which are necessary to their existence. Some are so intimately related that each lives on the exhalations of the other. Legumes and the bacteria of their root tubercles are each beneficial to the other. The farmer understands the necessity of rotating his crops by this nitrogen producing combination when the soil has been depleted of that element.

In medicine, there is a symbiotic trinity if you please, made up of physician, nurse and pharmacist. It is of the utmost importance that each symbiont should recognize its proper sphere and function so that the appropriate distribution of tasks will make for a strong and harmonious symbiosis. A. E. H.

A CURE FOR IMPATIENCE

Just as repeated mild infections may produce tissue changes of real consequence in the human body, so the little annoyances of daily life, if not guarded against, may lay the foundation for functional disease.

Frequently, in motoring down the street some figure suddenly comes to life and manifests a frenzied desire to make a last minute crossing before the vehicle, only to resume the same static pose after passing. The driver explodes and calls the individual an adjective fool or perhaps some other name whose frequent repetition has been known to lead to profanity. Then again the tables may be turned, and it is the pedestrian who feels compelled to burst out because of some "idiotic" driver's antics. A motorist passes another and at once slackens to an interfering pace; and a pedestrian in like manner steps in front of one of his kind on the sidewalk without the slightest apparent thought or by-your-leave gesture.

To meet with discourteous treatment at the hands of the unthinking and inconsiderate moron is vexing of course, and some degree of resentment is a perfectly normal reaction but anger may lead to the more destructive brain-storm, and the after effects are not pleasant.

An antidote might be found in a joyous self-complacency. It is suggested that as soon as the moronic diagnosis has been made instead of resorting to vituperation, the offended person smite his breast with pride, and like the righteous Pharisee say, "Thank God I am not like him"; retaining unimpaired a serene and blissful equanimity. A. E. H.

NEWS ITEMS

Dr. C. D. Lufkin, Northfield, Minn., was recently married to Miss Ann E. Gwynne, of Windver, Pa.

Dr. J. J. Flynn, has been appointed county physician of Missoula County, Mont., to succeed the late Dr. E. D. Peck.

Dr. H. W. Morcom, after an absence of several years, has returned to Virginia, Minn., and opened offices for general practice.

Dr. A. R. Zintek, formerly of Milwaukee has recently moved to Winona, Minn., where he has opened offices for general practice.

The District Court at Detroit Lakes, Minn., has permanently enjoined Dr. H. M. Fisch, from the practice of medicine and surgery in that county.

Dr. W. W. Hollman, of Northbrook, Ills. has moved to Corsica, S. D., where he will continue his active practice as well as operate the local hospital.

The Isolation ward at the county hospital at Helena, Mont., has been closed, as all of the infantile paralysis patients have been cured and discharged.

Dr. Martin Nordland, Minneapolis, was the principal speaker at the September meeting of the Renville County Medical Society held at Olivia, Minn.

Contracts have been awarded for the construction of the new $100,000 community hospital at Vermilion, S. D., and work on the same will be started at once.

Dr. A. C. Johnson, Great Falls, Mont., has gone to the Harvard University where he will spend several months in study and then will make a European trip to complete his course.

The Sioux Falls District Medical Society opened their fall meeting with an address by Dr. E. T. Bell, of the University of Minnesota, his topic being, "Nephrosis and Nephritis."

Miss Lorena Wiard, Aberdeen, has been named as president of the South Dakota State nurses examining board. Over 100 applicants for certificates as registered nurses have been made.

Dr. A. M. Limburg, Fargo, returned last month from New York City, where he attended the National Fraternal Congress of America. The doctor was elected vice-president of the medical section.

Dr. F. W. Orvedahl, recently in practice in California, has opened offices at Flandreau, S. D., where he will continue general practice. Dr. Orvedahl is a graduate of the University of Nebraska.

At the annual meeting of the Northern Minnesota Medical Associated, two very valuable addresses were made at the banquet by Dr. R. E. Scammon and Dr. A. E. Jenks, both of the University of Minnesota.

Dr. J. A. Myers, Minneapolis, was a guest speaker at the September meeting of the Cerro Gordo County Medical Society at Mason City, Iowa, his subject being "Diagnosis and Treatment of Tuberculosis."

Members of the Grand Forks Medical Society held their first fall meeting last month with a large attendance and Dr. Rose Mitchell, Winnipeg, as the guest speaker, his subject being "Toxemia in Pregnancy."

St. Paul will extend an invitation to the Inter-State Post-Graduate Medical Association of North America to hold its 1935 convention in that city. This annual meeting would bring from 3,500 to 5,000 physicians to the convention.

Dr. J. M. Gibbons, who has been in active practice at Finley, N. D., for the past ten years, has moved to Bismarck. Dr. and Mrs. Gibbons were given a farewell party by over 100 of their Finley friends before leaving their old home.

Dr. and Mrs. J. H. Moeller, Maddock, N. D., were greatly surprised when over 200 of their friends gathered at their home and celebrated the 25th anniversary of their residence in that city. The doctor was presented with a purse of silver.

Dr. Frederick Koelsch, chemistry instructor at the University of Minnesota, received the Irving Langmuir prize, the highest award in pure chemistry research, at the eighty-eighth convention of the American Chemical society in Cleveland.

Dean E. P. Lyon of the University of Minnesota medical school was elected president of Phi Rho Sigma, national medical fraternity, at the closing session of the organization's convention He succeeds Dr. Irving S. Cutter of Northwestern university.

At the annual meeting of the Northern Minnesota Medical Association, held at Brainerd last month, Dr. G. I. Badeaux, Brainerd, was elected president; Dr. Arthur N. Collins, Duluth, vice-

president; and Dr. O. O. Larsen, Detroit Lakes, secretary-treasurer. Duluth was chosen as the meeting place for 1935.

A scroll was sent to Rome, Italy, from Rochester by the physicians of the Mayo Clinic as an indication of their appreciation of the honor which was bestowed on the institution, when, October 22, 1932, the Italian government bestowed on Drs. W. J. and C. H. Mayo, the Cross of Knight Commander of the Royal Order of the Crown of Italy.

The Radiological Society of North America will hold its next Annual Meeting at the Hotel Peabody, Memphis, Tennessee, December 3-7, 1934. The Medical Profession is cordially invited to attend. Further information may be obtained by addressing the Secretary-Treasurer, Dr. Donald S. Childs, 607 Medical Arts Building, Syracuse, New York.

Every state in the union will be represented in the advance registration of more than 80 of the 150 who will attend the sixth annual medico-military symposium of medical reserve officers at the Mayo Clinic October 8, and continue for two weeks. The sessions will be held each afternoon and evening. Morning assemblies will be devoted to clinics in the hospitals.

James A. Enright, residing at Minneapolis, entered a plea of guilty before the District Court, to a charge of practicing healing without a Basic Science Certificate. The specific charge against Enright was that he was holding himself out to the public as being engaged in the practice of medicine and surgery. The Judge after hearing the facts imposed a sentence of thirty days in the Minneapolis Workhouse and the defendant was placed on probation for a period of one year.

Designed to check the ravaging effects of tuberculosis, trachoma and other diseases among the Indians, a vast hospital building and remodeling program is being carried out with a $2,016,400 public works allotment to the Indian bureau by the U. S. government. Plans are being drawn for construction of 13 new hospitals, the remodeling and improvement of seven old hospitals, and the installation of additional facilities such as heating plants, water supply systems and elevators in a number of other institutions in Minnesota, So. Dakota and Montana.

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters). William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota is the speaker. The program for the month of October will be as follows: October 3—"Heart Tonics"; October 10—"Pneumothorax Treatment"; October 17—"Acute Appendicitis"; October 24—"Beriberi"; October 31—"The Biopsy in Cancer Diagnosis."

Dr. J. Burns Amberson, Jr., of Bellevue hospital, New York city, will be the speaker at the annual meeting of the Minnesota Trudeau Medical Society to be held Saturday, October 6. A dinner meeting for members will be held at the Lowry hotel in St. Paul at 6:30 p. m. At this time a tribute will be paid in commemoration of eighty-sixth anniversary of the birthday of Dr. Edward Livingston Trudeau, founder of the sanatorium movement in the United States. Dr. Trudeau was born October 5, 1848. The tribute will be given by Dr. W. J. Marcley, one of Minnesota's pioneer workers in the movement. Following the dinner a scientific program will be given in the Ramsey County Medical society rooms in the Lowry Medical Arts building at 8 p. m., at which time Dr. Amberson will give a paper on "Estimation of the Healing Process in Pulmonary Tuberculosis and Its Importance in Treatment." This program will be open to all physicians of the state. Dr. Amberson is the visiting physician on the Service for the Study of Chronic Pulmonary Diseases at Bellevue. He has written a number of scientific and popular articles for magazines.

BOOK NOTICE

Spinal Anesthesia Technique and Clinical Application, by George Rudolph Vehrs, M.D., C. V. Morley & Co., 1934.

The writer has presented in a compact volume an excellent summary of our present knowledge of spinal anesthesia. No one with less information than is contained in this book should attempt to employ spinal anesthesia, nor is there any reason why he should seek further information. Because of its brevity and yet its completeness of essential facts concerning the subject, it should be an excellent text for both physician and student.

The notation as to the use of novocaine as the safest drug is particularly timely. One of inexperience is too apt to be led astray in this respect by a plausible representative of some chemical concern. As the writer ably points out, with proper selection of patients and type of operation to be performed, spinal anesthesia is the most nearly ideal anesthetic we have at the present time.

WALTER A. FANSLER.

The JOURNAL LANCET

Minneapolis, Minnesota
October 15, 1934

New Series
Vol. LIV, No. 23

American Student Health Association

Business Section of the Proceedings of the American Student Health Association, December 28-29, 1933, at Chicago

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Committee on Constitutional Revision and *Committee on Standard Nomenclature* to be discontinued, as their work has been completed.

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REPORT OF SECRETARY

The Proceedings for 1932 have been very much delayed, partly due to the publisher's difficulties and partly due to a sharp cut in clerical assistance in the department of the secretary. Under date of December 23, the publisher informs us that the Proceedings will be in the mail within three weeks from that date. In the financial report the bill for the Proceedings is, therefore, outstanding —and will be $540.83

Letters From Applicants for Positions—If any heads of departments are considering additions or changes in the personnel of their Student Health Services, we suggest that they look over a number of letters which we have from applicants for such positions. Many of these applicants have a good background, and some have had Student Health experience.

Your secretary represented the American Student Health Association at the organization meeting of the *Mid-Atlantic Section*, Washington, D. C., May 17, at the invitation of the chairman, Dr. R. G. Beachley. During the year the secretary also visited the Student Health Services of Dr. Beachley, at Washington College, Chestertown, Maryland; Dr. Frank Smith, at Amherst College, and Dr. E. J. Radcliffe, at Massachusetts State College.

"Refund to Sections"—By request we elucidate the meaning of this term. This means, that if a given member institution of the American Student Health Association is likewise a member of a local section, with paid-up A. S. H. A. dues for the year, $2.50 will be refunded to the section on behalf of that member institution. To date only $7.50 has been refunded, i.e., the North Central Section.

Unpaid Dues—Of our membership of 128 institutions 105 have paid the dues for 1933. The 23 with unpaid dues represent almost one-fifth of our membership—a total of $230. The secretary will be glad to tell you personally whether your college or university is in this category.

Tentative Constitutions for Local Sections—Dr. Forsythe and Dr. Raycroft formulated a tentative constitution for the guidance of the new local sections. Copies of this constitution were sent to each chairman by the secretary.

Reports—We beg to acknowledge the receipt of reports from member institutions on their Student Health Service. We should like to receive such a report from each of our members, as they are most convenient in answering the numerous inquiries regarding Student Health work which come to our office.

Respectfully submitted,

MARION HAGUE REA,
Secretary-Treasurer.

FINANCIAL STATEMENT
American Student Health Association—1933

Receipts

Balance brought forward	$ 719.96	
Income from 1933 dues (128 members, 105 paid dues)	1,050.00	
Income from 1932 Proceedings	12.25	
Income from 1931 Reprints	7.09	
Total	$1,789.30	

Disbursements

Expenses of 1932 Meeting—		
Hotel Astor	99.35	
Incidental Expenses	53.43	
		$152.78
President's Communications—		
Printing Dr. Smiley's letter	13.98	
Postage	3.00	
		$16.98
Preparations for 1933 Meeting—		
Printing 850 Programs	54.75	
Envelopes, Stamps, Addressing	14.61	
Round trip ticket to Chicago	45.13	
		$114.49
1 copy "A Standard Classified Nomenclature of Disease"	3.50	
1 copy "Biennial Survey of Education, 1928-30"	.25	
		$3.75

"Certificate of Merit" for Amherst		30.00
Refunds to North Central Section for Iowa State, Minnesota and Wisconsin Universities		7.50
Mimeographing Constitution and By-Laws for State Sections		7.72
Additional Expenditures—		
Stationery, supplies, stamps	32.20	
1932 Proceedings, postage and registration	1.26	
Telegrams	2.99	
Notary Public fees	1.00	
Secretarial services	67.50	
Tax on checks	.54	
		$105.49
Total		$ 438.71
Balance on hand		1,350.59
		$1,789.30

BUSINESS MEETING

Friday, December 29, 1933, 10 A. M.

President Smiley Presiding

I. Reports were presented by representatives of the eight Sections which have already organized and the four Sections which plan meetings for the near future.

(a) Pacific Section, Dr. Dyment.
(b) North Central, Dr. Boynton.
(c) Indiana, Miss Louise Strahan.
(d) Ohio, Dr. DeWeese.
(e) New York, Dr. Baldwin.
(f) Pennsylvania-New Jersey, Dr. Ritenour.
(g) Mid-Atlantic, Dr. Beachley.
(h) Southern, Dr. Milford.
(i) South Central, Dr. E. Lee Schrader.
(j) Great Lakes, Dr. Forsythe.
(k) Mississippi, Dr. Wilhelm.
(l) New England, Dr. McCurdy.

II. Report of the Tuberculosis Committee, Dr. Lee H. Ferguson (see under Scientific Section).

III. Report of the Committee on Health Service Practice and Hygiene Teaching in Normal School, Dr. A. O. DeWeese (see under Scientific Section).

IV. Report of Committee on Constitutional Revisions, Dr. Forsythe, Dr. Raycroft.

1—Constitutional changes are proposed in order to attain a better representation through increased members-at-large, i.e., an increase from 2 to 6. The committee advises the creation of a council composed of the past presidents, the officers, and six members-at-large, which committee shall carry on the business of the association with power between the meetings. It was the sense of the meeting that such changes were desirable, and the committee was authorized to prepare the necessary amendments to the Constitution.

2—The Committee on Constitutional Revision also recommends the authorization of the refund of $2.50 to the local sections, and the requiring of an annual report from each section. (Adopted.)

V. Report of the Committee on Nomenclature, Dr. Bradshaw, chairman; Drs. Gould, Forsythe and Diehl. Several years ago, the Boston Nomenclature for the Classification of Diseases was adopted by this association. In the meantime a new classification has appeared—"Standard Classified Nomenclature of Disease"—published by the Commonwealth Fund, New York City, at $3.50 the copy. This is recommended by the American Medical Association, the American Public Health Association, the American Heart Association, American Surgical Association, and thirty other similar organizations. It includes the international list of the causes of death, and bases the classification on anatomical, topographical and etiological grounds. An affirmative vote on the adoption of the new Nomenclature was made.

VI. The Executive Committee report of the meeting of December 28th was accepted.

(a) The secretary was instructed to send bills for 1934 directly to the doctor at the head of the Student Health Service in each member institution, instead of to the treasurer or bursar.

(b) Application for membership of the following institutions was passed upon favorably: Bennington College, Bennington, Vt.; Rhode Island State College, Kingston, R. I.; Ohio University, Athens, Ohio.

(c) The following institutions are found in arrears for three years or more, and were dropped as members: Beaver College, Georgia University, St. Paul's School, West Virginia University.

(d) The organization of the following eight local sections was authorized: Pacific, North Central, Indiana, Ohio, New York, Pennsylvania-New Jersey, Mid-Atlantic and Southern.

(e) Dr. Storey has offered the following resolution, which was passed upon favorably by the Executive Committee:

> "If the National Health Association is willing to organize another conference on health problems and health education in colleges and teacher training institutions in 1936, the American Student Health Association will do all within its power to co-operate. It is suggested that teacher training institutions be included, and that the meeting be called at the time of the A. S. H. A. annual meeting."

VII. Discussion of the proposed Second National Conference on Health Problems in 1936. Miss Louise Strachan explained its inception.

VIII. Report of the Nominating Committee (Drs. Storey, Forsythe, Lee) accepted.

President, Dr. R. W. Bradshaw.

Vice-president, Dr. Anna M. Gove.

Secretary-treasurer, Dr. Marion Hague Rea.

Members-at-large for two years:

Dudley B. Reed, University of Chicago.

Ralph I. Canutesen, University of Kansas.

K. Frances Scott, Smith College.

Members-at-large for one year:

H. L. Marshall, University of Utah.

E. Lee Shrader, St. Louis University School of Medicine.

Bertha S. Dyment, Stanford University.

AMERICAN STUDENT HEALTH ASSOCIATION SECTIONS

1. *Pacific Coast Section.*

Chairman, Dr. Thomas Storey, Stanford University, Stanford, Calif.

a. *North Pacific Division of Pacific Section.*

Dr. Fred N. Miller, University of Oregon, Eugene, Ore.

	Institutions
Washington	14
Oregon	12
Idaho	5
Nevada	1
	32

4 members of A. S. H. A.

b. *Central Pacific Division of Pacific Section.*

Dr. Thomas Storey, Stanford University, Stanford, Calif.

	Institutions
Northern California	34

2 members A. S. H. A.

c. *Southern Pacific Division of Pacific Section.*

Dr. Donald McKinnon, University of Southern California, Los Angeles, Calif.

	Institutions
Southern California	34

No members A. S. H. A.

2. *Rocky Mountain Section.*

Dr. H. L. Marshall, University of Utah, Salt Lake City, Utah.

	Institutions
Montana	5
North Dakota	5
South Dakota	10
Wyoming	1
Utah	7
Colorado	10
	38

4 memhers A. S. H. A.

3. *South Central Section.*

Dr. E. Lee Shrader, St. Louis University School of Medicine, St. Louis, Mo.

	Institutions
Nebraska	18
Kansas	35
Missouri	49
Oklahoma	21
	123

7 members A. S. H. A.

4. *Southwestern Section.*

Dr. Jessie L. Herrick, Texas State College for Women, Denton, Texas.

	Institutions
Arizona	3
New Mexico	4
Texas	75
	82

2 members A. S. H. A.

5. *North Central Section.*

Dr. Harold Diehl, University of Minnesota, Minneapolis, Minn.

	Institutions
Minnesota	28
Wisconsin	14
Iowa	42
	84

6 members A. S. H. A.

6. *Great Lakes Section.*

Dr. Warren Forsythe, University of Michigan, Ann Arbor, Michigan.

	Institutions
Illinois	58
Michigan	28
	86

5 members A. S. H. A.

7. *Indiana Section.*

Dr. Floyd Riggs, Indiana State Teachers College, Terre Haute, Ind.

	Institutions
Indiana	25

3 members A. S. H. A.

8. *Ohio Section.*

Dr. Lee Ferguson, Western Reserve University, Cleveland, Ohio.

	Institutions
Ohio	53

14 members A. S. H. A.

9. *Mississippi Valley Section.*

Dr. George T. Wilhelm, University of Tennessee, Knoxville, Tennessee.

	Institutions
Kentucky	28
Arkansas	18
Tennessee	30
Louisiana	10
Mississippi	19
	105

3 members A. S. H. A.

10. *New York Section.*

Dr. Jane Baldwin, Vassar College, Poughkeepsie, N. Y.

	Institutions
New York	61

18 members A. S. H. A.

11. *New England Section.*

Dr. Edgar Fauver, Wesleyan University, Middletown, Conn.

	Institutions
Maine	5
Vermont	4
New Hampshire	3
Massachusetts	33
Connecticut	10
Rhode Island	4
	59

25 members A. S. H. A.

12. *Pennsylvania-New Jersey Section.*

Dr. J. P. Ritenour, Pennsylvania State College, State College, Pa.

	Institutions
Pennsylvania	64
New Jersey	15
	79

19 members A. S. H. A.

13. *Mid-Atlantic Section.*

Dr. R. G. Beachley, Washington College, Chestertown, Md.

	Institutions
Maryland	17
Delaware	1
West Virginia	13
District of Columbia	10
	41

6 members A. S. H. A.

14. *Southern Section.*

Dr. Lee Milford, Clemson Agricultural College, Clemson, South Carolina.

	Institutions
Virginia	30
North Carolina	35
South Carolina	21
Alabama	12
Georgia	33
Florida	8
	139

9 members A. S. H. A.

Constitution and By-Laws as Revised December, 1933

American Student Health Association

CONSTITUTION

Article I

Name

This organization shall be known as the American Student Health Association.

Article II

Purpose

The purpose of this Association is the establishment of an official and authorized organization through which institutions and individuals engaged in student health work may work for the promotion of health, the prevention of disease, and the care of student illness.

Article III

Officers

The officers of the Association shall be a President, a Vice-president, and a Secretary-Treasurer, who shall be elected annually. There shall be a Council consisting of the above officers, all past presidents, and six members-at-large to serve for two years, three to be elected at each annual meeting. The President of the Association shall be *ex-officio* chairman of the Council. There shall be an Executive Committee consisting of the officers and two other members elected by the Council from its membership.

Article IV

Membership

Membership in the Association shall be open to educational institutions of recognized standing, not conducted for financial gain or profit, as represented by some department directly interested in promoting student health, such as the Student Health Service, or the Department of Physical Education. Each institutional member shall upon request appoint some individual, preferably in the department concerned, to represent it as accredited spokesman at annual and other meetings of the Association, and in conventions or other activities of that body.

Article V

This constitution shall be amended when the proposed amendment is favored by four-fifths of those voting upon it.

BY-LAWS

I Membership

Sec. 1—Eligibility—Any health service, department of physical education or other organization of any educational institution in the United States or Canada which, in the opinion of the Council is directly interested in the care of the health of its students shall be eligible to membership.

Sec. 2—Election—Applications for membership will be received by the Council and submitted, if approved, to vote of the Association. Majority vote will elect.

Sec. 3—Termination — Membership in the Association may be terminated upon recommendation of the Council and majority vote of those voting at an annual meeting.

II Dues

Membership in the Association shall require the payment of $10.00 annually as dues.

III Duties of Officers

Sec. 1—Officers—The duties of the President, the Vice-president, and Secretary-Treasurer of the Association shall be the usual ones performed by such officers.

Sec. 2—Council—The Council shall direct all affairs and activities of the Association not otherwise provided for by the Constitution, in addition to those duties so specified.

Sec. 3—Committees—The President shall appoint such committees as may promote the work of the Association.

Sec. 4—Standing Committees—

A. There shall be five standing committees, designated and described as follows:

I. *Committee on Informational Hygiene.*

This committee would deal with content and with methods of classroom or laboratory presentation of information concerning hygiene. It would be concerned with researches and teaching experiences in the field of general hygiene, personal hygiene, family and other group hygiene and public, community or other intergroup hygiene.

II. *Committee on Health Service.*

This committee would be concerned with such matters as (a) health examinations (pre-requisite, single and periodic) required or voluntary, their purpose, content and "follow-up"; (b) health conference and consultations, required or voluntary; (c) treatment, emergency, ambulatory, infirmary, or hospital; (d) relation with athletic teams.

III. *Committee on the Hygiene of Physical Activities.*

This committee would be concerned with such matters as (a) the hygiene of physical exercise, whether required or voluntary, intramural or inter-collegiate; (b) the contraindications for physical exercise, and (c) modified exercise for various degrees and varieties of disability.

IV. *Committee on Administrative Hygiene.*

This committee would be concerned with the hygiene of such matters as (a) college buildings, grounds, dormitories and cafeterias; (b) private boarding houses and lodging houses patronized by college students; (c) student social life; (d) curriculum and schedule; (e) advice offered by student advisers on other matters than curriculum and schedule particularly those that relate to mental, emotional and social maladjustment; (f) employees; (g) faculty.

V. *Committee on Departmental Organization, Administration and Integration.*

This committee would be concerned with (a) the organization of college hygiene programs through departments, offices, etc., wholly or partly in the field of hygiene; (b) the appropriate emphasis of "native" hygiene present in other curriculum courses and subjects and in other university offices; (c) variations to meet local conditions; (d) personnel, and (e) records, statistics and costs.

VI. *Executive Committee.*

This committee shall act for the Council during intervals between meetings of the Council.

B. Constituency and Duties of Standing Committees.

I. The Chairman.

(a) Each of these standing committees shall have a chairman appointed by the President with the approval of the Executive Committee to serve until relieved by a successor regularly appointed for the purpose. It shall be the duty of the Executive Committee to review the chairmanships of these committees at each annual meeting of the Association and reappoint them or make new appointments at such meetings. Vacancies occurring in the intervals between meetings of the Association shall be filled by appointment by the President.

(b) The Chairman and members of each of these six standing committees shall be responsible to the Executive Committee for one full session in the program of the Association at each regular annual meeting; or for such part of a single session as the President may designate. Each committee shall in general confine its program sessions to its own field. The Chairman of a committee may draw upon any member of this Association for contribution to his program session, or he may, with the approval of the President, make use of contributions from other sources.

II. Members.

(a) Each committee shall have four members in addition to the chairman. A chairman may increase the membership on his committee with the prior approval of the President.

(b) Members of committees shall be appointed by the President, but recommendation for appointments shall in general be made to the President by the chairman of the committee to which the appointment is to be made. Committee memberships, with the exception of the chairman, shall be for one year only, unless reappointment is made.

(c) The members of each of these committees shall collaborate with their chairman in planning researches, investigations and reports, the presentation of papers and the development of program sessions.

IV Election of Officers

Nomination for office shall be made by a nomination committee appointed by the President and announced at the first session of the annual meeting. The nominations shall be submitted to a vote of the Association at the business meeting. Majority vote elects.

V Meeting

There shall be an annual meeting of the Association and such other meetings as may be called by the Executive Committee.

VI Local Sections

(a) Regional sections of the Association may be formed in any locality, with the advice and consent of the Council for the purpose of promoting interests in harmony with the objectives of this Association.

(b) Such regional sections of the Association shall comply with and benefit by the following regulations:

1. For members in both a regional section and this Association a financial return of dues shall be made to the treasurer of the regional section in such amounts as shall be determined by the Council of this Association.
2. A report for the regional section shall be presented at each annual meeting of this Association.
3. Other regulations may be provided by a two-thirds vote of delegates voting at any annual meeting.

VII Revisions

Upon recommendation of the Council, By-Laws may be enacted, amended or suspended by a two-thirds vote of those voting at an annual meeting.

Re-definition of the Duties of the Five Standing Committees

By Dr. Thomas A. Storey

By-Laws III, Section 4—Standing Committees.

A. There shall be five standing committees ...."concerned with the preparation of programs for the annual and other meetings of this Association. The following re-definition of the duties of these committees is based on the interpretation of student health as a combination of somatic health, mental health, and social health. Somatic health means physical or organic health and consequent physiological health. Mental health means wholesome emotional adjustment and decisive control of mental conflicts. Social health means wholesome social personality, sociability, ethical behavior, and good citizenship (in contrast with anti-social citizen behaviors).

a. *Committee on Problems of Informational Hygiene*—This committee shall be concerned with the utilization, discovery, and educational interpretations for teaching purposes of scientific information relative; first, to the *principles* or causes that ultimately determine and regulate the production, improvement, maintenance, and defense of physical, mental, and social health; and relative, second, to the *practice* of physical, mental, and social health by the individual, by the family, and other groups, and by society. It shall be concerned also with the better techniques and conditions of teaching and with the adequate preparation of teachers in these fields.

b. *Committee on Problems of Student Health Service*—This committee shall be concerned with problems of securing histories and making examinations of the somatic, mental, and social health of students; and with the wise instruction, advice, and direction of students after health examination, required health conference, or voluntary health consultation; with ambulatory, infirmary, hospital, and convalescent treatment; preventive measures; research in these fields; and with the preparation of lay teachers and administrators for safe participation in health service programs.

c. *Committee on the Hygiene of Physical Education Activities*—This committee shall be concerned with the problems of health protection of students engaged in physical education of activities, and with the problems of successful leadership for the practice of somatic, mental, and social health by student groups engaged in the recreational, play, game, sport, and athletic activities characteristic of physical education programs.

These problems have to do with: (1) The prevention and care of athletic injuries; (2) the practice of habits by the group, squad, or team that produce, improve, maintain, and defend somatic, mental, and social health (wholesome social personality) in participation, training, conditioning, and competition; (3) the opportunities of the physical education teacher, the director of physical education, and the athletic coach and team doctor, for leadership in the practices of health; and (4) with research in these fields.

d. *Committee on Administrative Hygiene*—

This committee shall be concerned with the production and control of favorable environmental hygiene by the college or university for the benefit of its students and faculty. It shall deal with:

1. Physical environment, e.g. illumination, ventilation, heat, water supply, plumbing, sewage disposal; smoke, dust, and noise nuisances; janitor service; safety, fire and accident; toilets and rest rooms; calamity control; and sanitation and safety of buildings, dormitories, grounds, play fields.

2. Biological environment, e.g. food and food handlers, milk supply, diet kitchens; insects, vermin, and other animals and animal carriers of pathogens, and noxious plants.

3. Social environment, e.g. cases and carriers of communicable disease; isolation and quarantine; public health laboratories; hospital, infirmary, and clinics; rooming houses, eating places, and student clubs; social programs, big game crowds and social gatherings; and control of epidemics.

e. *Committee on Departmental Organization, Integration, and Administration for Student Health*—This committee shall be concerned with (1) The responsibilities of the college or university for student health; (2) the organization of hygiene programs by colleges and universities for the satisfaction of those responsibilities through departments, divisions, schools, committees, offices, and officials; (3) the formulation and enforcement of regulations by the college or university that safeguard the health of students, e.g., required vaccination, entrance health examinations, refusal of admission to applicants with inadequate health or who may menace the safety of others; required periodic health examinations; termination of registration because of inadequate health or because of health menace to others; required health examinations and certificate of competent health for admission to athletic training and to teacher training; (4) the opportunities of colleges and universities, over and above their legal and social responsibilities, to organize and maintain hygiene programs for the information, education, and protection of students; (5) their opportunities to set up research laboratories for the investigation of student health problems; and (6) with the integration and administration of health programs by colleges and universities as separate departments or as parts of a single administrative unit.

Individual Psychology and Education*

Alfred Adler, M.D.†
Chicago, Ill.

I BELIEVE it is a very valuable development in the care of the health of students to pay attention to their mental development as well as to their bodily health. The School of Individual Psychology which Viennese colleagues and myself established early in this century, has always sought its maximum usefulness in the field of education, and our experiences in the lives and characteristics of students has been very wide. I should like to tell you a little of the approach of Individual Psychology, regarding the study of life development, but first I should like to make clear the basic assumptions or theories of Individual Psychology.

Individual Psychology has as its basic premise the indivisibility or unity of the personality. Thus feelings and actions in an individual are different forms of expression of the same fundamental life plan. They can best be understood or unified into a coherent whole by adding to the already recognized forms of causation, the teleological plan. When we look for the goal of an individual we see how all his thoughts, feelings and actions are purposive and form together a technique of living, the aim of which is to accomplish this goal. But just as each character trait, whether it be a datum of objective behavior or of subjective experience, is to be understood as part of a unity or total pattern and giving meaning by its context, its relation to other events in the total functioning pattern of the personality, so an individual can only be understood as an event in a greater pattern—that of human society. In this way we can evaluate the goal of an individual by stating it in terms of social interest or social adaptation and with this standard based on the fact that successful life adaptation depends upon the capacity of each individual for co-operation and contribution to human society, we can enter into the mystery of personality development and can commence our understanding of not only neurosis and psychosis, but other cases of social failure such as delinquency, drug addiction, alcoholism, sex perversion and prostitution. The question must be, in evaluating any personality: Has he been rightly prepared for the solution of the problems of social adaptation confronting every human individual in any part of the life—occupation, friendship, love and marriage? And if he has not been rightly prepared, how has he attempted to solve them, in what way and on which point has he failed?

Individual Psychology discovered that by the third or fourth year of life a child has decided upon its goal and from this time on shows a unified life plan which can be seen running throughout his whole career like the "leitmotif" of a musical composition or work of art. We discovered further that this goal and life plan are always the result of the first experiences of the child, its education by its parents, its dealings with brothers and sisters, its organic abilities and disabilities in relation to its physical environment and his conclusions. Out of these experiences it forms an opinion of itself and of life, chooses a way of life which represents the best adaptation consistent with its experiences, that overcomes its feeling of helplessness and gives it even a sense of power and success. At this period the degree of social interest is formed and we find that the mal-adaptations of later life come from situations in childhood where social interest was not rightly devoloped.

Three classes of children contribute to the increasing number of failures in our society: the pampered child, the organically defective child and the hated child. But far the greatest number come from the class of pampered children who are either spoiled by being given too much or who are rendered dependent on others through over-protection, over-training, etc. To pamper a child in any of the many ways in which it can be done is like artificial mutilation, for it unfits an individual for a courageous, spontaneous approach to the problems which confront him in increasing numbers and complexity in his growth from childhood to maturity. The organically handicapped child, struggling along with imperfect organs, may become too dependent or could use his imperfections as an excuse, or he can over-compensate the defects if courageous and wisely educated and become a very successful person. And, finally, the hated child suffers, of course, the greatest injury to the

*Dr. Alfred Adler spoke extemporaneously and the following paper is an edited stenographic report of his address at the American Student Health Association, Chicago, December 29, 1933.

†University of Chicago.

proper development of social interest and later on frequently swells the ranks of the criminal and other anti-social classes.

Now in reference to the understanding of students in terms of their life adaptation you should find out the right way to understand students as they enter the University and observe carefully how they devolop later. It is necessary then to get a certain insight into the life and development of each student who enters a university and this may seem to be very difficult as no two are alike; all are different from each other. To find out their particular personalities, their individuality, we have to judge from little signs, from parts of the whole pattern. We can find out what is wrong by guessing the connections between these little signs which we can easily observe and constantly verify or guess by corroborative data from further study. In this way we see the pattern of a student's life as a whole; we see the causative factors of heredity and environment and the purposive trend which has emerged from the individual's interpretation of these experiences in early life.

It is well to ask the student: What is your earliest recollection? I believe it is a very important question because we can see from the answer to this question the interests of the person. An early recollection is never haphazard; it is selected from a myriad of early experiences because it is meaningful, perhaps in a symbolical or allegorical way. Perhaps you would be interested in my experience that remembrances of illness or death occur in 60 per cent of medical students. This is very significant and important. I would say such a student is fitted for the medical profession because he is interested in illness and in death. Of course we cannot always put the question in just this form for some students would know what we are searching for, but it is in general true that early recollections give valuable clues as to an individual's interests. It is not difficult to find, for instance, if some one is an akoustic type, a motor type or a visual type; or if he is interested always in being supported, or if he wishes to be independent; if he leans too much on his family, or seems to be more interested in social life, etc. The more one hears the early experiences of an individual the more one is impressed with their importance and their relation to the present situation and interests of the character.

You should look, too, for the creative power in each student and this can be seen best, for instance, in what he has done until now and what he wants to do later. Also in regard to his imagination and in regard to his dreams you should direct question, for you will always find a part of his personality if you understand his dreams. It is well to ask him to tell a dream which has impressed him because such a dream, and in particular a recurrent dream, is an allegorical statement of what to expect in life. It is as if an individual looked ahead, creating an imaginary situation out of which a conclusion could be drawn. We should always expect to find dreams of falling in an ambitious character who conducts himself cautiously in life, in order to avoid failure. He says in such a dream: Beware; you could fall! It is the emotion that a dream creates which is important and not the content of the dream itself. Individual psychology has shown that the function of dreams is to prepare a mood, an attitude toward a problem and that it always reinforces the life plan of an individual by this trick of stimulating emotion.

What is your greatest fear in life? Is a question that will often produce valuable information enabling you to confirm your first impression, to construct further in your own mind the design of a student's personality.

It is important to find out something in regard to his social interests; to find out if the student is trained for co-operation. It is not so difficult to ascertain both from his remembrances of his early life and from your study of his present conduct in the university. The style of life of each person depends upon his opinion of life, his set of values, his opinion of his own possibilities and his degree of social responsibility. Character and personality should be viewed as the appearance of the struggle for significance in terms of social interest. Therefore the degree of social interest will be an index or expression of the student's personal struggle for significance, his attempt to maintain or increase his self-esteem. The maintenance of self-esteem is a problem and may be achieved by active or passive means. You will find, of course, that the greater part of students who are examined have limited themselves in a very clear way and these limits are mostly too narrow. For example, I remember a student who stuttered terribly, but only when he met people; so we could say that he limited his contacts with others by means of his stuttering. You find many persons who do not stutter with their tongues, but they stutter in their conduct, in listening to lectures, when they should answer questions, in fact in their whole attitude, their gait, etc., and this must be corrected. Such individuals are usually those who have experienced life outside of their

mothers' care as hostile and therefore they do not connect themselves with others harmoniously.

The progress of a student is dependent upon his style of life and how he has limited himself and therefore it is necessary in examining students to find out their limits. Limits are self-imposed. It is helpful to find out, for instance, if they want to be supported, if they are lacking in independence. It is very easy to find out if a student leans on others or if he is always accepting from others. He can get along well in schools where the teachers understand him or if the teachers are helpful and he is appreciated; but he is not well-prepared for less favorable circumstances and we see such a student slowing up as he approaches new situations, graduation for instance.

No student should be permitted to leave the school or university if it is not wholly sure that he has adapted himself to our social life. Failures can be ascertained in a brief examination, particularly by asking questions dealing with the early childhood, asking him if he had been tidy or untidy as a child. If he has been untidy his untidiness makes a great difficulty in his life—he cannot order it, he is always waiting for another person and we see that such a style of life is mistaken. Ask him: Can you easily make friends? If he tells you that it is not easy you can be sure that he loves himself. It is important to find out something about his parents. If he tells you his education was very strict it means that he did not feel very warmly invited into life. Find out if he was a timid child. Of course this is not a very convenient question for students to answer but you can put it in the first childhood as you know that his style of life must be essentially the same now. If a person has a hangdog look you can be sure that he is not sociable. If he looks aside he is not able to connect himself immediately with others. If sagacious, he really speaks in a way to make himself understood and he looks for interest in others, listens to questions and concentrates on making a better connection with other people. Of course you can always look for inherited factors but these are not so important because everybody utilizes his inherited capabilities and disabilities to serve his goal; some persons make good out of them, others not.

The position of the student in his family constellation is important and an only child in a family is a special type, for the "only child" runs through his style of life and this impression is always present. The second child is always aware that he has a forerunner, a pace-maker, and is usually very ambitious as a result. A youngest child is in a still different position for he has no followers. He is born under more favorable conditions as a rule but his great aspirations are so often not expressed because of self-distrust.

The growth of human beings is like the growth of trees when they grow together. In each tree for its whole life there is the impression made by the other trees. It is along such lines that this questioning of students should be directed in order to give you a good picture of the student so that you could explain to him the repeating pattern of his life, showing him his mistakes and the reasons for them and encouraging him to revise his style of life. If you can explain it so that he understands, that he can be convinced, then in one month, two months, half a year later you will find out if it has worked or not. If not, then you can explain it again in a more significant way so that he can understand. Repeatedly you should ask him for his recent experiences and as repeatedly show him the mistakes in his approach to his problems arising from his faulty life style. Above all there must be encouragement and a non-critical attitude and as a therapeutic goal the best possible solution must be sought for each individual of the three problems of life—occupation, society and sex.

I believe that each student who behaves in a manner which is not normal should be examined in the health department of his university after such a manner as I have outlined in order to find out the cause. It should be our aim to improve the life of the next generation and that is what you are doing when you work in this way; it is work done for the next generation.

The Management of Acute Intestinal Obstruction; With Special Mention of the Character of the Vomiting and Distension*

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IT HAS been frequently stated, even within recent years, that despite advances in the recognition of abdominal ills and improvement in the technique of abdominal surgery, that the mortality of bowel obstruction continues to be almost as great as it was at the dawn of the era of abdominal surgery, somewhat more than 50 years ago. Fortunately, a definite change for the better is now generally palpably apparent.

The discovery of the value of saline in prolonging the lives of dogs with experimental high intestinal obstruction by Hartwell and Hoguet in 1912, lent considerable impetus to the study of and renewed interest in the problem of bowel obstruction. Within the past few years the already available information concerning the identification of acute intestinal obstruction has been so correlated, that in a hospital that is "obstruction-minded," the junior resident staff almost invariably recognizes such cases when they present themselves. Appreciation of the value of conservative decompression of the distended gut by suction, as an adjunct to operation and as the chief therapeutic agent in a large number of instances of adhesive obstruction, makes the surgeon less apprehensive when dealing with the formidable problem of intestinal distension.

The Diagnosis

It may truly be said that no acute abdominal lesion can be recognized with such precision as a block in the continuity of the gut. In the concomitant occurrence of intestinal borborygmi heard with the stethoscope at the acme of recurrent intermittent pain, which the patient frequently describes as "gas pains" the presence of *intestinal colic* is established. It now only remains to be determined whether this intestinal colic be due to a mechanical block to the continuity of the gut, some dietary food indiscretion or to an entero-colitis. On the basis of such general symptoms as vomiting, diarrhea, fever, and distension this differentiation can usually be readily made. It need scarcely be mentioned that a patient with early simple bowel obstruction may not appear very ill. The pulse is usually not hurried and apart from the pain features, he may not present the appearance of a sick man. In my experience the pain is often described as "gas pains," and their significance is usually not appreciated until vomiting and distension occur.

The Character of the Distension

An aid of great value in the interpretation is a scout film of the abdomen made with the patient supine. Whereas, normally gas is present throughout the intestinal canal of the adult, it is usually only visible on the Roentgen film in the stomach and in the colon. When stasis occurs in the small intestine, be the cause mechanical or inhibitive (paralytic) in origin, gaseous shadows become apparent. Visualization of the distended loops of small intestine is, therefore, synonymous with intestinal stasis. The stethoscope tells whether it is due to a mechanical block or to inhibition of contraction of the intestinal musculature.

When the Roentgen film is reviewed in the light of the clinical findings, considerable may be learned concerning the status of the obstruction. It is usually at once apparent whether the obstruction is in the colon or in the small intestine (Figures 1 and 2). In my experience, acute obstructions of the distal colon have not given rise to distension of the small intestine, the ileo-caecal check-valve limiting the distension to the colon. The grade of intestinal distension is also apparent. If the patient has had a number of enemas, which is usually the case when he presents himself for examination, the persistence of gas in the colon when the distension is limited to the small intestine indicates that the obstruction is partial in character (Figure 3). In other words, gas is continuing to leak past the obstructive mechanism. Non-absorbable gas does form locally in the gut as the result of putrefactive processes, but the chief source of gaseous distension is swallowed air. The exact location of the obstruction in the small intestine can not be foretold with certainty, but on the whole one can know whether it is in the upper, middle, or lower thirds of the gut from the pattern and length of the distended intestinal coils. Occasionally one

*Read before the meeting of the Sioux Valley Medical Association on January 24, 1934, at Sioux City, Iowa.
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FIGURE 1





A B

FIGURE 2

FIGURE 1—A patient with *intestinal colic*, no vomiting, but enormous distension. The Roentgen film reveals that the distension is limited to the colon. At operation a carcinoma of the sigmoid flexure was found as one would anticipate from a correlation of the clinical and Roentgen findings. The enormous distension of the caecum is accounted for in that the portion of the bowel with the largest diameter dilates most readily.

FIGURE 2—A—Adhesive obstruction of the small intestine. Distension is limited to the stomach and small intestine. No visible gas in the colon after enemas indicates that the obstruction is complete.

FIGURE 2—B—Complete decompression by suction applied to an indwelling duodenal tube.

can not be entirely certain whether the distension concerns the small intestine or the large; in such an event a small amount of barium may be administered as an enema.

Despite the shortcomings of Roentgen examination, the only agency with any just claim to accuracy in determining the grade and the location of the distended intestinal coils in bowel obstruction is the X-ray film. It is my conviction that the only film that gives an accurate impression of the degree and the location of the distension is the film made with the patient lying on his back. When the patient lies prone, due to the pressure upon the abdominal wall, one can not trace through as well in continuity the coils that are distended. The vertical film made sitting or standing gives some indication of the relative amounts of fluid and gas present, but does not begin to be of the same order of importance to the surgeon in determining the extent to which the gut is distended as does the film taken with the patient supine.

It is immediately apparent that it is the presence of gas in the stomach and the intestines that







FIGURE 3

A—Incomplete adhesive obstruction in a boy of eight years. The persistence of gas in the colon after enemas indicates that the obstruction is incomplete. Fecal masses may also be seen in the hepatic flexure. The dilated coils of small intestine occupy the left and more central portions of the abdomen.

B—After seven hours of suction.

C—Practically complete decompression after 20 hours' suction. A month later this patient again became obstructed. He was again decompressed successfully by suction; when feeding was resumed, he re-obstructed and an enterostomy was done. Because the obstructing mechanism did not relent, a final direct attack had to be made on the site of obstruction. The boy has remained well. In simple adhesive obstructions, persistent obstruction, despite a well-functioning enterostomy, has been unusual in my experience.

accounts for the tympany elicited normally over the abdomen. Were there no gas in the intestine, the entire abdomen would be as dull as the liver on percussion. It is my observation that apart from chronic obstructions which frequently give rise to a visible and palpable pattern of the distended coils, that the clinical criteria of inspection, palpation, and percussion are not to be relied upon in adjudicating the extent or the location of the distension.[1] Only an X-ray film will afford dependable information upon these points. At the same time, it is quite obvious that inspection and percussion will give some relative indication of whether the distension is great or slight, but it sheds no penetrating light upon the question of which segments of intestine are distended and how great that distension is. To speak plainly, our clinical criteria can not accurately differentiate a great distension of a few intestinal coils from a lesser grade of distension shared by a longer segment of gut.

Identification of the Type of Obstruction Present

The exact nature of the obstruction, however, is an item concerning which our information at best is inferential and not absolute. External hernias, the congenital obstructions such as intestinal atresias and imperforation of the rectum and anal canal, and intussusception of infancy may usually be accurately identified by the rather obvious findings or characteristic train of symptoms present. The greatest difficulty lies in the determination of the exact nature of an obstruction in the small intestine. When external hernia and intussusception, which are statistically rather common types of obstruction, are excluded, adhesive obstruction is by all odds the most likely. It is probably the most frequently observed of all varieties of obstruction. Yet, obtsruction of the small bowel by a gall-stone, carcinoma of the small intestine, or an enteric intussusception, though uncommon, occur sufficiently frequently to demand attention in the consideration of the probable nature of a small bowel obstruction.

In a patient with obstructive features who presents scars on the abdominal wall as evidence of a previous laparotomy, the natural inference is, and it is usually correct, that the obstruction is adhesive in character. A number of patients have come under my observation, however, with multiple scars on their abdominal wall and occasionally tell a story of one or repeated operations for previous bowel obstruction, in which a careful correlation of the clinical and X-ray findings belies the presence of a mechanical block in the gut. I have, too, fallen into the error of exploring the abdomen of such patients, but on the whole, I believe that the correct diagnosis can be made in most instances and operation averted. I have elsewhere described this picture under the name of "functional spastic ileus"[2] but I must confess that I know little of its nature. The features which permit of recognition despite the close simulation of an organic obstruction are these: The patient is usually a young neurotic woman. Definite evidence of intestinal colic is usually readily demonstrated. Clinical distension is often striking, yet the patient's general condition appears rather satisfactory. Scars of previous operations may be in evidence. There may have been repeated small emeses, but it is usually gastric and not stercoraceous in character. The most important information when linked with the clinical findings is that the distension concerns the colon. The exclusion of an organic obstruction as the cause of the gaseous distension is often apparent in the extension of the distension to the rectum or the differentiation may be made by the administration of a small barium enema. These patients respond well to conservative treatment, but the unfortunate thing is they are often subject to frequent such attacks.

The Nature of Vomiting In Obstruction

At this juncture, I should like to say something of the character of the vomiting in its bearing upon the probable location of the obstruction. It has been my observation that many patients with obstruction of the left colon may not vomit at all despite an enormous distension. If vomiting does occur, it is usually small in amount and gastric in character. I have frequently passed a duodenal tube into the stomach on such a patient on admission, only to find that his stomach is empty. New-borns with imperforate anus appear to vomit more readily than adults with a carcinoma of the pelvic colon.

I believe that it may be laid down as a rule that when the vomiting is stercoraceous or fecal in character, the obstruction is in the small intestine. I have yet to see a patient with an uncomplicated colonic obstruction with fecal vomiting. On the contrary, a patient presenting a block well down in the small intestine has frequent emeses of fecal-like vomiting. And when a duodenal tube is passed into the stomach, a liberal return is almost invariably obtained in the presence of considerable distension.

The ileo-caecal sphincter, I believe, is the answer. In an obstruction of the small intestine with considerable distension, the entire intestinal canal above the obstruction participates in the distension, permitting of the regurgitation of the

contents of the lower gut by anti-peristalsis into the stomach. When the distal colon is obstructed, the contents of the small intestine find their way into the colon, but the check-valve arrangement of the ileo-caecal sphincter precludes regurgitation into the small intestine. Roentgenologists familiar with the "incompetent ileo-caecal sphincter," I appreciate, would *a priori* take issue with such an explanation. My response is that almost every patient with acute obstruction of the pelvic colon that has come under my observation has failed to show at operation the slightest trace of distension of the ileum, in juxtaposition to the caecum. At the same time, I have seen the caecum perforate or become gangrenous without the small intestine participating in the distension.

The gradual increase of intraluminary pressure as occurs in obstruction undoubtedly exerts a different action than the sudden increase of pressure brought about by the quick introduction of a barium enema, under a high column of gravity pressure, guided by the pressure of the examiner's hand upon the abdomen. The pressures employed by the Roentgenologist are undoubtedly much in excess of those which may spontaneously develop in the colon under conditions of obstruction. No rule is inflexible and most laws are transgressed, and exceptions undoubtedly occur. In acute obstructions of the left colon, however, competency of the ileo-caecal sphincter, in my experience, has almost invariably been present. The Roentgenologist employs a column of barium three or more feet in height which gives a pressure of at least 100 millimeters of mercury. Measured intraluminary pressures in the acutely obstructed colon at operation have been found to vary between 20 and 40 millimeters of mercury. When the blood pressure in the capillaries is exceeded (20 millimeters of mercury or more), it is readily apparent that necrosis of the gut logically follows. Dr. Louis Sperling of our staff is giving this problem special study and his observations will be published elsewhere.

The Significance of Rebound Tenderness

Simple obstruction to the continuity of the intestine does not usually give rise to abdominal tenderness or rigidity. When, however, the obstructing mechanism compromises the blood supply and serum or blood escapes into the peritoneal cavity, rebound tenderness is almost invariably present. Intestinal colic combined with rebound tenderness, therefore, usually indicates a potential strangulation type of obstruction. The only frequent exception is that of intussusception. The strangulated segment being invaginated into a normal ensheathing cylinder, it is apparent that only under unusual circumstances will blood escape into the peritoneal cavity.

The Treatment

The ideal objective in the management of bowel obstruction is release of the obstructive mechanism with restoration of the continuity of the intestinal canal. Realization of the ideal, however, is so frequently purchased at an exorbitant cost and sacrifice that compromise on measures of expedience is often the safest and wisest counsel. Compromise in the selection of the therapeutic agency to be employed can often be made with advantage in the simple obstructions and particularly those of an adhesive character. The experience of many years has abundantly shown that a large number of these may be treated by tapping the obstructed bowel above without releasing the bowel from the obstructing agency. More recent experience has also adequately demonstrated that in a number of instances mechanical obstructions of adhesive origin may be decompressed by water siphonage suction applied to a duodenal tube without formal operative procedure.[3 4 5]

In strangulation obstructions such as torsion or encirclement of the gut by an adhesive band (recognizable clinically usually by the presence of rebound tenderness), intussusception, volvulus and strangulated hernia compromise on the choice of a therapeutic agency to be employed can not be made. In such instances, operation is urgently indicated. The item of interference with continuity of the bowel is not the only concern; the viability of the gut is also at stake.

Transfusion

In strangulation obstructions, the blood loss factor is often a particular of considerable consequence. With the egress of blood prevented through the veins and with blood being brought to the gut under the motive force of systolic blood pressure, rupture of the small vessels occurs with ensuant hemorrhagic infarction of the gut, bleeding into the lumen of the bowel and sanguinous exudation into the peritoneal cavity.[6]

The following case illustrates very well the occurrence of serious blood loss in a strangulation obstruction: A female child of 18 months (University Hospital Number 605182) was admitted with an intussusception of 72 hours' duration. The pulse was extremely hurried and feeble, the rate being about 200 per minute. Three-hundred cubic centimeters of saline solution was given subcutaneously without improvement of the general condition. After being brought to the operating room, 500 cubic centimeters of

saline solution was again given intravenously without slowing the rapid pulse. Three-hundred cubic centimeters of blood was then administered through the same needle, and the pulse became stronger and slowed to 160. Thereupon, ether was administered, and a compound intussusception (entero-enteric and ileo-colic) was found and reduced.

A Meckel's diverticulum constituted the apex of the intussusception. The bowel was diffusely red but viable. The patient made an uneventful convalescence.

Without adequate blood replacement, such a patient could not have been safely operated upon.

Saline

The administration of saline solution is an important item in replenishing the fluids lost by vomiting. When the distension is great, another significant source for the loss of body fluid is failure of absorption from the gut. Saline solution in no sense exhibits the virtues of a specific except in obstructions to the very upper reaches of the intestinal canal where hydrochloric acid, bile and pancreatic juice are lost without any great opportunity for absorption. That sodium chloride and water may more effectually substitute for the loss of these important body fluids than any other chemical agents is well known. In low obstructions, though the administration of saline solution helps to combat dehydration, it does not afford the organism the same protection as it does in high obstructions.

In brief, the therapeutic agents available for the treatment of bowel obstruction are: the administration of saline solution; the transfusion of blood (in strangulation obstructions in which the blood-loss factor may be significant); decompression of the distended gut by suction applied to a duodenal tube, and operation.

The first two obviously exert no direct effect upon the obstruction but are of material consequence for the improvement of the general condition of the patient. In what type of case decompression of the distended gut is to be sought by suction applied to a duodenal tube and in which operation is to be urged from the start, is answered in general terms by the table (Fig. 4). In any doubtful case, operation is in order. In general it may be said, that when operation is done the operation of election, viz; locating the site determining its exact nature and undoing the obstruction is only to be done in early simple obstructions; in late simple obstruction, operations of necessity such as enterostomy should be done. In strangulation obstructions, there is no choice; after reduction of the obstruction, if the gut is not viable it must be excised. It is my impression that in such instances, it is far safer usually to exteriorize the devitalized bowel and establish a temporary complete intestinal fistula in the manner of the Mikulicz operation than to do a primary resection.

In the employment of suction applied to a duodenal tube in the treatment of mechanical obstructions the precaution must be observed of taking follow-up bedside films to be certain that the distended

FIGURE 4

CLASSIFICATION AND TREATMENT OF INTESTINAL OBSTRUCTIONS

Clinical Classification	*Pathologic Classification*	*Treatment*
A. Mechanical.		
I. Narrowing of lumen.		
1. Strictures of bowel wall.		
a. Congenital. (Atresia; Stenosis; Imperforate Anus)	Simple (except in neoplastic strictures of the colon).	Operation, preceded by suction for decompression in late cases except in occlusion of the descending colon.
b. Acquired. (Inflammatory; Traumatic; Stenosis; Vascular; Neoplastic)		
2. Obturation.		
3. Compression from without. (Especially pelvis and retroperitoneal duodenum.)		
II. Adhesive bands. (Congenital; Inflammatory; Traumatic; Neoplastic)	Simple or strangulation.	Suction, operation for persistent obstruction and in strangulation.
III. Hernia.		
1. External.		
2. Internal.		
IV. Volvulus.	Strangulation.	Early operation.
V. Intussusception.		
B. Nervous.		
I. Inhibition ileus—(paralytic) adynamic.	Simple.	Suction.
II. Spastic ileus—dynamic.		
C. Vascular.		
I. Thrombosis and embolism of mesenteric vessels.		
II. Severance or injury of mesenteric vessels. (Operative or blunt trauma.)	Strangulation.	Early operation.

bowel is actually decreasing in size.[7] Mere relief of symptoms is no criterion, for often the patient says that he feels comfortable immediately after the commencement of suction. Swallowed air and fluids dumped in at the gateway of the intestinal canal being effectually removed by suction, there may be no accretion of distension. The bowel having accommodated itself to a certain grade of distension, colicky pain may stop if the existing distension is not augmented. The necessity for generous administration of saline solution to patients receiving suction is obvious. It has been my plan to give enough fluid subcutanously or intravenously to insure a liberal urine output (700-1000 c.c. every 24 hours). An adequate urine output is adequate proof of a positve tissue fluid balance.

Summary

The diagnosis and therapy of bowel obstruction can be said to be on a rational basis. No acute disaster of the abdomen can be so readily recognized as acute intestinal obstruction. In the concomitant occurrence of intestinal borborygmi at the acme of recurrent colicky pain, the presence of *intestinal colic* is established. On the basis of general symptoms such as vomiting, distension, fever, and diarrhea, other causes of intestinal colic can be excluded. No other acute lesions which cause abdominal pain produce *intestinal colic*. Fecal vomiting is a feature of obstruction of the small intestine; frequently patients with obstruction of the left colon may not vomit at all, despite considerable distension. With the employment of the Roentgen film correlated with the clinical findings, a surprisingly accurate diagnosis can usually be made.

The keynote of therapy in acute bowel obstruction is decompression. It may be achieved in the adhesive group particularly, oftentimes by the employment of suction applied to a duodenal tube alone. Operation is indicated in all strangulation obstructions as well as in those where the obstructive mechanism continues despite decompression of the distended gut. Saline solution and transfusion of blood are adjuvant agents of real value.

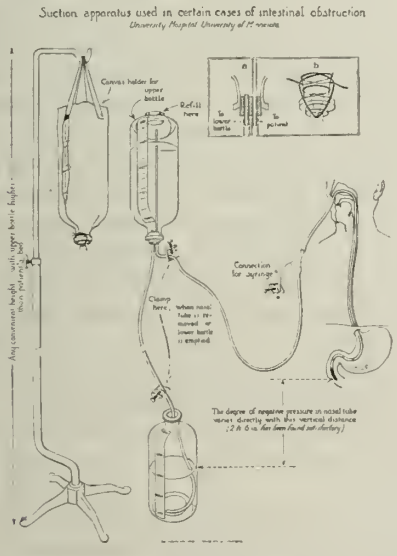


FIGURE 5

The suction apparatus employed in the decompression of adhesive obstructions. In instances where mucus tends to plug the catheter, irrigations with a warm solution of sodium bicarbonate serves as a satisfactory solvent. Employing a suggestion of Dr. George Eitel, a hole is cut in the bottom of the inverted bottle, into which a rubber cork is fitted. This facilitates refilling the bottle by the nurses. A special tube has been made for me by the Davol Rubber Co. of Providence, Rhode Island, which permits of more readily intubating the duodenum.

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Pregnancy With Unruptured Hymen*

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IT HAS long been recognized that impregnation may occur with an intact hymen but the few reports of such cases found in the literature are an indication that its occurrence is rare.

Williams[1] in his text-book on Obstetrics records two cases he had seen in which conception had occurred with the hymen intact. Williams also calls attention to a report of Achenback[2] made in 1890 recording 25 collected cases up to that time.

Gal[3] in 1924 reported a case of a six-months pregnancy in an unmarried woman 21 years of age in whom the hymen was almost imperforate, the opening being large enough to admit a small bougie. Flechtenmacher[4], also in 1924, reported a case of a three months pregnancy in a married woman who had never had complete intercourse. The hymen was intact, showing no tears or scars. Bischoff[5] in 1925 reported the case of an abortion at two months occurring in a patient in whom the hymen was unruptured. Schilling[6] in 1925 reported a pregnancy occurring in a married woman within a month after marriage. In this case the vaginal orifice was entirely occluded by an intact hymen. Near the middle two minute openings were discovered, neither of which would admit an ordinary surgical probe. Fomenko[7] in 1927 reported a case in a woman married 17 years who had never completed intercourse properly. All attempts at coitus ended with ejaculation outside the vaginal orifice. The patient had not menstruated for seven months. Examination revealed a seven months pregnancy with a normal intact hymen. Stein[8] in 1928 reported a case of a two months pregnancy in a married woman who had never had real intercourse. The hymen was intact, hardly admitting one finger. The pregnancies in these cases reported went on to full term and delivery.

Report of Case

J. R., an unmarried woman 21 years of age, reported on February 16, 1934 complaining of nausea which had been present for 10 days. The nausea occurred after each meal and was relieved by more food. At that time she stated that she had missed her menstrual period due January 20, 1934. She was sure she was not pregnant because she had not had intercourse. A pelvic examination was not done at that visit. The patient's history was essentially negative, except for certain contagious diseases in childhood she had never been ill. The menses began at age 10 and had always occurred regularly every 28 days. She had no pain at the periods.

On March 7, 1934 the patient was seen again. The nausea was relieved but she had had no menses. Further history brought out the fact that the last menstrual period had been on December 22, 1933. About January 15, 1934, intercourse had been attempted but not completed. A general physical examination was essentially negative. Examination of the genitals showed an unruptured hymen which would barely admit the tip of the smallest applicator. On rectal examination the uterus was enlarged to about the size of a 2½ months pregnancy. A tentative diagnosis of pregnancy was made. The following day a morning specimen of urine was obtained and sent to the Department of Obstetrics for a Friedman test. The report on the test two days later was positive, confirming the diagnosis. In such cases where the possibility of an ovarian cyst must be considered, the hormone test is of distinct aid in diagnosis.

The patient was seen again on April 17, 1934. She said she felt so well she was sure she was not pregnant, although she had not menstruated. On further questioning, she stated that the reason she was sure she was not pregnant was that she had consulted an abortionist who had examined her and told her that she could not possibly be pregnant.

Since the last examination she had married and had intercourse several times. Examination of the genitals now showed the hymen torn in two places and a vaginal examination could be done easily. The cervix was soft and enlarged and the fundus extended mid-way between the symphosis and umbilicus.

Summary

A few cases of pregnancy with the hymen unruptured have been reported in the literature.

(Continued on Page 657)

*Read before the fourteenth annual meeting of the American Student Health Association, Chicago, December 29, 1933.

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The Practicing Physician and The Health Department*

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Are Medicine and Public Health on Divergent Roads?

I HAVE long held the view that public health can, in the long run, progress no faster and no farther than the organized medical profession wishes. This is based on the belief that medicine and public health are devoted to a common cause; that lay opinion in health matters is eventually strongly influenced by the instruction and advice of the attending physician; and that health departments will be created and supported only when public opinion favors them. Past history has shown the public health movement largely emanating from the medical profession. And, in the larger sense, it has depended upon the physicians for its application. The anti-tuberculosis, anti-diphtheria, and anti-smallpox movements, the social, infant, maternal and mental hygiene movements, and many others have all been sponsored or supported by organized medicine. Physicians have held the fort as part-time health officers, usually to their own detriment, until the community has been ready for a full-time health officer and an adequately supported department. It has seemed almost axiomatic that the health department must work in harmony with the physicians of the community and they in turn with the health department.

The constant search for, and application of preventive procedures has been one of Medicine's proudest chapters, and still is. To be sure, there have been temporary local misunderstandings between practicing physicians and health officers, but the fact has remained that there seem to have been no basic differences between the objectives and ideals of public health and those of medicine.

Of late, perhaps due to the depression, certain disturbing influences have arisen in such a way as to challenge the soundness of this view. Let us take it out, dust it off, and see whether it is still worth keeping. Are public health and the practice of medicine still united in a common cause? Will the medical profession still determine either actively or passively the extent to which the specialty of public health will develop? This public health profession shows signs of beginning to stand on its own feet. Unlike the other specialties of medicine, it has a wide public contact. In some quarters this alliance with the public is viewed with alarm. Has Medicine raised a kitten which grew into a panther?

Perhaps you will be interested in the detached viewpoint of one who has been both a practicing physician and a health officer and now is neither.

What Makes the Health Officer Queer?

Just as it takes certain peculiarities of temperament to produce a physician, so also with the health officer. Like the physician, the health officer does not seek material wealth. Like the physician, he has deep sympathy for human suffering. Like the physician, he is intrigued by the challenge that lies in unnecessary illness. True to his scientific training, he seeks and develops techniques for the remedy of deplorable conditions. Many of these techniques, as we shall see, are almost as specific when applied to the population *en masse* as are quinine or the arsenicals or the antitoxins applied to the individual.

The health officer has attained, somehow, a relatively broad social viewpoint. Instead of being intimately concerned with the individual, he is concerned almost solely with the mass. He knows, for instance, that toxoid administered to 60 or 70 per cent of his child population (including the preschool group) will reduce his diphtheria deaths to a minimum. He is not immediately concerned with the two or three per cent of those who will still have a positive Schick until additional dosage is given. Even though a few deaths occur among this group, their number will not add materially to his death rate per hundred thousand population. The physician, on the other hand, is vitally concerned over these two or three per cent, since failure to immunize even one may cost him the life of a patient. The health officer deals impersonally with the entire population as a group. The physician deals personally and intimately with a few individuals within that group.

So thoroughly is the health officer imbued with this desire to reduce unnecessary illness and death among the people as a whole, that he makes some costly sacrifices. Not the least of these, as I can personally attest, is abandonment of the practice of medicine, for which he was trained, and taking a path diverging from that of his colleagues. Too often he is thereafter regarded by them as neither

*Read at the Annual Meeting of the Montana Public Health Association, Helena, July, 1934.

fish nor fowl, some peculiar hybrid, either a "horse with stripes or a zebra without stripes." In some instances he becomes almost a pariah.

Another enormous sacrifice is his loss of personal independence. He is always ultimately accountable to a lay-superior or lay-board, often political, before whom he must plead his cause. His success or failure in doing so will determine his opportunties for accomplishment, his financial support and even his tenure of office. No longer may he revel in that fine disdain for politics enjoyed by his medical friends. If he believes the game is worth the candle, he must develop at least some rudiments of statesmanship. In order to obtain even meager appropriations, he must convince his appropriating body in non-technical language and with assurance that they will get a dollars worth for every dollar he spends. He must be able to attract public support sufficiently to convince his superiors that support of his projects is desired by their constituents.

He is subject to attack on all sides by many: Those who oppose all medical activity, those who find a real or imaginary grievance in the effect of his work on them as individuals, those who want more health work done, those who want less. No one likes to be quarantined. No one enjoys abating a nuisance reported by the neighbors. Everyone resents restrictions on personal liberties, even when these liberties menace the health of others. The practicing physician is glad to be relieved of these onerous responsibilities to society.

The health officer's end-results are under the careful scrutiny of his public health associates. There is no more inscrutable exposé of the health department's shortcomings than the annual mortality reports of the census bureau. There is no more pitiless analysis of performance than the appraisal form of the Committee on Administrative Practice of the American Public Health Association. The physician's shortcomings may be buried, but the health officer's are preserved in perpetuity. The vital statistics of a population are written in figures more enduring than the tombstone! His Chamber of Commerce may scorn him if they do not win the Inter-city Health Conservation Contest sponsored by the United States Chamber. His women's clubs come demanding their "rights" to a lowered infant and maternal death rate. His school superintendent may blame him for humiliation at the hands of a rival superintendent who boasts of superior school health facilities.

Finally, when he has won his battles for many years, has controlled epidemics, has safeguarded the food, water and milk supply, has reduced the death rates from preventable causes, then his public may suddenly propose to cut health appropriations to the vanishing point because the community is now so healthy that all this expenditure for health is useless! Need we ask further, "What makes the wildcat wild?"

With this understanding of the health officer's peculiarities and his problems we are now in a better position to understand some of his sins.

The Health Officer's Viewpoint

We have seen that the health officer is a zealot. He is activated by an inner fire which has caused him much personal sacrifice. His rewards lie in the accomplishment of some part of his objectives. When finally his path is cleared of obstacles, political, financial, scientific, and administrative, he may then drive straight for his goal. And herein lies, in my belief, the commonest cause of misunderstanding between the practicing physician and the health officer.

To be more specific: Let us assume that the diphtheria death rate in this community is 14 per 100,000 population, as it is still in some sections today. This would be about four times the rate for the rest of the country. The health officer is harrassed by justified criticism from other cities, his public health colleagues, his own townspeople. He knows that his armamentarium contains a specific weapon with which to slay this dragon—immunization of at least 40 per cent of all preschool children and 60 per cent of all school children. He is handicapped by lack of funds. After carefully computing the least possible amount for which he can wield his weapon, and after repeated rebuffs from the appropriating body, public opinion finally crystallizes for his support and the money is forthcoming. Is it any wonder that he rushes into the campaign as quickly as possible, often forgetting to take his medical colleagues into his confidence? He hires doctors and nurses, opens free clinics throughout the city and does a land-office business. When he is through it has cost him about 30 cents per child, his diphtheria death rate vanishes, and so does his support by the county medical society!

Wherein has he been at fault? To be sure, he might have tried the so-called "Detroit Plan." In place of a cost of 30 cents per child, he would then have paid more than double that amount. Possibly this additional cost is justified in order to obtain the splendid support of the physicians enjoyed by the Detroit Health Department. Many health officers feel, however, that they cannot afford it.

He might have forbidden the free immunization of those who can afford to go to a private

physician. This would mean one of two things: a social service investigation which would cost about five times the amount for which he could immunize, or a signed statement from the applicants certifying that they were unable to pay a doctor. This latter is, he feels, unnecessarily degrading and what is worse, it discourages attendance which will defeat his objective. He knows that the greatest obstacles to immunization of any kind are ignorance and lethargy. (See charts.)

Social service investigations, affirmations of poverty, even the inconvenience of going to a doctor's office do not help in overcoming this lethargy.

Despite all this, most health officers are willing to agree that the State should not furnish free goods and services, the sale of which represents a livelihood to a group so essential to the community and its health as the medical profession.

The Health Officer's Mistake

What our friend should have done, then, is to make every *reasonable* effort to send people to their family physician. The theme of his educational propaganda, printing, radio, newspaper and nurses' home visits should be: "Go to *your* doctor and have this important and valuable thing done. It is worth the money it costs. *But,* if you can't afford to do this, come to the clinic and have it done at the taxpayers' expense." You will note that this is an art. His prime object is to get 70 per cent immunized. If he stresses poverty too much it results in embarrassment and failure. If he stresses the fee to the private physician too much it results in active opposition and failure. There will always be those who would like one or the other feature stressed a little more. He cannot please all, but does the best he can.

What he should do further is to go to his county society and lay his cards on the table; explain the situation to these reasonably minded colleagues; point out the urgency of the matter and the fact that no further time can be lost; explain that his plan might result in giving free medical care of a temporary nature to a few who lacked self-respect, but it would also send many to physicians who had not been to them before; remind them that the patient properly attached to his family physician will not desert him for a free clinic; and, above all, demonstrate that as health officer, he has the interests of the medical profession in mind.

In other words, health department procedure should be worked out in conference with the county medical society on every possible occasion. This procedure rarely fails.

The Physician's Mistake

Note the high percentage of immunization done by private physicians on these charts. Doctor Geiger, health officer of San Francisco, recently followed this procedure in the matter of periodic school health examinations. After conference with the county medical society, he agreed to withdraw his examining physicians from certain schools until cards had been sent to all parents urging them to have the child examined by their family physician and enclosing a physical examination blank for the physician to fill out and return to the school health department. About 25 per cent returned the cards satisfactorily filled out by the private physician. The school examiners then proceeded with the remaining 75 per cent. Miss Harriet Fitzgerald, dental hygienist for the Berkeley schools, has in ten years reduced the incidence of dental caries in elementary school children something like 75 per cent. She has sent over a thousand children to private dentists each year.

On the rare occasions when agreement cannot be reached in conference with the county society, many health officers give ground. Denver has recently closed its free immunization clinics and instead furnishes free toxoid to the physicians together with a report blank. The health department concentrates on education but gives no free service. The chairman of the immunization committee of the county society tells me that very few children have been treated thus far, but he hopes for better results soon. Denver will probably suffer an increase in diphtheria deaths because of the willingness of its health officer to let the society try this experiment. This has been the experience under similar circumstances in many Western cities. Perhaps Detroit and other cities, where immunization by physicians has been successful, have had superior medical leadership.

To come back to our health officer, we must admit, then, that he may have been at fault. But, his is a sin of omission rather than commission. And after all, he has reduced the diphtheria death rate with due regard to economy with the taxpayers' money.

High Infant Mortality: A Problem for Health Officer and Physician Alike

One more example because it represents a group of health department activities having to do with clinics other than immunization. Suppose the infant death rate is 108 per 1,000 live births as it is now in some sections. This is nearly twice as high as the rate for the country as a whole. Here again the health officer has a remedial procedure almost though not quite as specific as immuniza-

tion. He knows from the experience of hundreds of health departments that this death rate can be reduced by the application of five principles: Encouraging breast feeding; sterilization of utensils used in preparing infants' food, application by mothers of modern dietary procedures; protecting the infant from exposure to communicable diseases, and encouraging periodic, monthly examination by the physician. He, therefore, proceeds to have the nurse call at the home of the newborns with a decorative certificate of birth. While there, she ascertains whether the infant is under the regular care of a physician. If so, the mother is encouraged to continue. If not, she is urged to seek medical care as a preventive measure. If she feels she cannot afford it, she is invited to the health department "Well Baby Clinic." The purpose of this clinic is to weigh and measure infants periodically, supervise their general hygienic regimen and refer them at once to private physicians if any illness occurs. It almost invariably reduces the infant death rate if a majority of the infants are reached.

But now comes the private pediatrician who complains that supervision of hygienic regimen is his province and the health department is encroaching on his means of livelihood.

Undoubtedly this is true, and it should be brought to the attention of the health officer in his conference with the county medical society. He will then call their attention to the fact that his infant death rate must be reduced; that approximately 75 per cent of the children under one year are not under the regular care of a physician; that these people persist in lethargy and ignorance despite his best efforts; that they are strongly prejudiced against the idea of taking a well child to a doctor believing it is an unnecessary expense. He proposes, therefore, to conduct his well baby clinics primarily for the benefit of those unable to pay for medical care, but secondarily to demonstrate to this larger group of ignorant and lethargic that such a service is a wise investment. He assures the society that he will persist in every reasonable effort to divert those able to pay to the private physician's office at the earliest opportunity. Some illness in the child usually provides the opportunity. He cannot, however, exclude them from the clinic on the grounds that they are able to pay or it will be impossible to reduce the infant death rate. The issue is then clearly before the house. It is usually decided in favor of reducing the infant death rate at any reasonable cost.

Time forbids the elaboration of the example to the so-called prenatal clinics conducted by the health department. The same general principles apply, substituting the maternal death rate for the infant and the obstetrician for the pediatrist.

Parallel Paths in the Same Direction

We could proceed with further specific examples, but, in my opinion, we should still be unable to find any serious basic difference of objectives or ideal between the medical and public health professions. There may be difference in viewpoint, but these are susceptible to adjustment on the conference basis.

If we may continue to assume that the health of the public is a legitimate concern of the medical profession, and that the public health profession is a specialty within medicine, then our axiom still holds; the practice of medicine and the practice of public health go hand-in-hand. Today, more than ever before, the medical profession is acquiring an increasing social viewpoint. Perhaps for the first time collectively, they are beginning to think of the hundred who need medical attention for every fifty who get it. They are recognizing, especially in this State, that more must be done to interpret medicine to the public. They are realizing that at least some of their present difficulties are due to an inherent distrust of the medical profession on the part of some, a failure on the part of others to appreciate the fact that good medical care is essential regularly to every person, and that there is commonly failure to provide for these expenditures in family budgets. They are finding that the properly conducted health department with its nurses teaching by example in home, school, and industry, is their best ally in interpreting the medical profession to the public.

Similarly, health departments, more than ever before, are showing a willingness to confer with county societies and to build their programs with the medical profession constantly in mind. They are even capitulating with their medical colleagues on points of difference, and this, in some instances, to the point of allowing death rates to mount or becoming reckless with the taxpayers' money. There is less of the iron hand of the law in health department administration and more of the time-consuming, painstaking, educational effort. Truly, adversity, which has afflicted medicine and public health alike these past four years, gives rise to sympathy and understanding and union for mutual defense.

"Granulocytopenia"

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"Etiology"

ALTHOUGH there were about forty-five cases known before Schultz reported his case in 1922, it was not until then that Granulocytopenia became a definite clinical entity. While certain toxins elaborated by special organisms have long been known to produce a leukopenia, the profound drop in the granulocytes was rarely ever seen until late years. Typhoid fever, measels and influenza often inhibit the production of leukocytes but not to the degree seen in this new condition.

In granulocytopenia there are several possible causes. First, certain drugs seem to have a depressive effect on the bone marrow. These are usually taken over a long period of time and are quite commonly used. Madison and Squier have clearly shown that drugs containing amidopyrene and barbiturates are apt to cause granulocytopenia. Krake believes that any drug containing the benzene ring can produce the disease. Second, certain organisms were believed to be responsible by Schultz, and Dennis sought for focal infection as the cause. The organisms blamed have been salmonella suipestifer, pyocyaneous and Vincent's organisms. Third, individual orfamilial predisposition has been suggested by the report of Pauline Zinniger. Fourth, Shelly and Pepper believe it may be caused by an anaphylactic or allergic reaction. Fifth, any combination of the above factors, and sixth, no known cause.

The treatment is not as yet standardized but in the main the therapeutic efforts have been directed toward (1) eradicating all possible causative factors and (2) stimulating the bone marrow or allowing a depressed bone marrow to rest. Some cases have been known to get well without treatment although at best, with or without treatment the morality is high and the prognosis is uncertain. We wish to report another example of this condition as follows.

Mrs. O. H. M., age 40, married, housewife, became ill February 20, 1934, complaining of sore throat, malaise, anorexia and general indisposition. Her previous history was negative except for the ordinary diseases of childhood including a tonsillectomy. In 1928 an appendectomy and uterine suspension was done.

In January of this year she suffered from mumps complicated by oophoritis.

Physical examination at the onset of illness revealed a well developed, fairly well nourished female. Skin and mucous membranes pink.

Head and neck: Eyes bright, pupils equal, react to light and accommodation.

Nose: Negative.

Throat: Entire throat and roof of mouth bright red in color, especially the right tonsilar fossa. Uvula was very adematous. No patches were noticed at this time.

Chest and abdomen: Negative.

Extremities: Normal. Reflexes, normal and equal.

Temperature, 103; pulse, 110.

A tentative diagnosis of acute streptococcus sore throat was made. The throat was painted with ten per cent silver and an alkaline gargle prescribed. Ice bags were applied to the throat externally. Cultures were negative for diphtheria. The following day there was no improvement and a blood count was made which showed hemaglobin, 83 per cent; reds, 4,000,000; leucocytes, 800, with no polys. A diagnosis was then made of agranulocytompenia and she was sent to the hospital. The patient was given hydrochloric acid, one to four thousand subcutaneously and 200 three-grain capsules of yellow bone marrow daily. She was also given two exposures of X-ray to the long bones.

On February 26th her leucocytes had dropped to 400 and the red blood cells to 2,500,000. Her condition at this time was very grave and 500 c.c. of blood was given to her by the direct method. The following day her condition was considerably improved. The administration of the yellow bone marrow was continued and all other internal medication was stopped.

On the third day of her disease white patches appeared in the tonsilar fossa as well as on the tongue. Smears from these showed many organism of Vincent angina. Local applications of five per cent chromic acid was made daily to these areas throughout the course of the disease.

One other point of interest in connection with this case is that during her attack of mumps, which occurred one month previous to the onset of

(*Continued on Page 657*)

Hypertension*

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I. Primary or essential hypertension.

II. Secondary: or hypertension associated with demonstrable lesion in various viscera.
1. Nephritis: glomerular, pyelo, congenital cystic kidneys.
2. Eclampsia or toxemia of pregnancy.
3. Cardiac conditions: Aortic lesion particularly aortic insufficiency. Mitral stenosis, aortic stenosis: probably coincidental to age group. Arterio-venus aneurysm. Coarctation of the aorta.
4. Increase intercranial pressure. Cerebral tumors—edema.
5. Endocrine organs.
Thyroid: Thyrotoxicoses. Hypothyroidism.
Adrenal: Suprarenal tumors.
Ovarian: Menopausal. (Myomata).
Pituitary: Basophilism. Acidophilism.
Pancreas: Diabetes.
6. Toxic Types: Lead. Tobacco. Alcohol.
Infections: Pneumonia. Typhoid fever.

The above list is an effort to cover all possible conditions in which increased blood pressure is found. The first, essential hypertension, is the most common. Primary or essential are words used to advertise our ignorance concerning the cause of hypertension. The other members of the list are lesions in which increased tonus is sometimes associated. They are all very uncommon when compared numerically with the essential variety.

Briefly, in glomerulo-nephritis there is always an increase of blood pressure.

In pyelonephritis, the hypertension may be of the essential variety.

In congenital cystic kidneys, increased blood pressure occurs only when renal insufficiency supervenes.

The association of hypertension in toxemias of pregnancy will be discussed with the essential variety.

In cardiac conditions (aortic valvular defects), the increase of pressure is a compensatory affair. Some cardiologists think that there is some factor in rheumatic disease which leads to increased blood pressure in rheumatic lesions of the heart. It is wiser to assume that in any rheumatic lesion where there is also hypertension, the association is coincidental.

In arteriovenous aneurysm, there is a general increase of tonus at times, but in the limb affected there is always an increase of blood pressure.

In coarctation, we have the increased systolic pressure only in the upper limbs. The diastolic, in my own experience, is higher than normal in the legs.

There must be a diffuse increased cranial pressure to cause increased arterial pressure. The opinion that cerebral tumors cause increased vascular pressure is not borne out by experience.

The arterial pressure associated with changes in the endocrine organs will be discussed under essential hypertension.

Lead, tobacco and alcohol are put in this list merely to call attention to the fact that they are not considered as factors in causing hypertension. It is of interest to find that in most infections the blood pressure falls; but occasionally it rises far above the normal level. Typhoid is mentioned in all text books because of Thayer's report years ago. We have observed increased tonus in pneumonia during the acute stage.

ESSENTIAL HYPERTENSION

Etiology

No satisfactory explanation has yet been given for the cause of essential hypertension. Major's[1] apt quotation from Gull warrants repetition in this connection. Gull was discussing the attitude of physicians toward medicine: "We have no system to satisfy, no dogmatic opinions to enforce. We have no ignorance to cloak, for we confess it."

The one outstanding factor that we do know concerning etiology is that hypertension has an exceptional familial background. In sixty to eighty per cent of the cases one can elicit a family history of cardiovascular variations. While this does not give us a cause, it does comfort our ignorance. Let us review hastily some of the theories relative to hypertension.

The kidney has been blamed repeatedly for the cause of hypertension. This is quite natural because ninety per cent of all hypertensives at death show vascular changes in the kidney. In nephritis, the hypertension was at first explained by reten-

*Presented before the Twelfth Annual Meeting of the Great Northern Railway Surgeons' Association at Glacier Park, Mont., June 29, 1934.

sion bodies acting as pressor substances. However, none of these when obtained in pure form were found to have pressor action. Then it was thought that the resistance of the kidney in nephritis, due to the inflamed glomerular beds called for increased systematic pressure to compensate for this resistance. An enormous amount of blood goes through the kidneys daily. The vascular area for the size of the organ is very large. The glomerular tufts are anatomically peculiar and excellently adapted for filtration with proper pressure. It has been estimated that for three litres of urine, one thousand to fifteen hundred litres of blood pass through the kidney in one day.[2] In the light of this data, this explanation for the hypertension in nephritis sounds more reasonable, and has led to a similar line of reasoning for the cause of the increased blood pressure in the essential variety.

In essential hypertension the supposition is put forth that a spasm occurs in the afferent arterioles to the tufts. This spasm causes enough resistance to call for a general increase of tonus throughout the peripheral system, in order to produce the pressure for the normal filtration rate. But what causes the initial spasm? The spastic agent is sought in a substance or substances improperly detoxitized in the liver or other organs. If a noxious agent can cause diffuse glomerular nephritis, why cannot a noxious agent set the walls of the afferent vessels into a spastic state? This presumes a delicate selective action on the part of the noxious agent. Some think the spastic agent is bacterial in origin—the most likely source being from bacteria located in that overworked upper respiratory tract, tonsils, pharynx, sinuses and teeth. As the spasm continues, anatomical changes begin. Hyalinization of the arteriolar walls occurs, which is a degenerative process. This extends into the capillaries of the tufts causing partial to total loss of function. Sometimes, necrosis of the arteriolar walls occurs. This is found only in the malignant type of hypertension. This form always ends in death from uremia. While arteriolar change in the kidney is a prominent anatomical fact in hypertension, evidence is accumulating that similar changes occur in the arterioles all over the body. In other words, while the brain, the kidney and the heart, have been repeatedly implicated, evidence is accumulating that the arterioles of skeletal muscles and other viscera may show similar change.

The endocrine organs are still called on for an explanation of hypertension. The old idea of increased epiniphrine output has been abandoned. Cessation of ovarian function at menopause, with beginning hypertension, has been cited as an example of endocrine influence upon blood pressure. Cessation of ovarian function is associated with vasomotor disturbances. With the stabilization of the inter-relation of the glands, the tonus comes back to normal sometimes. Most of the hypertension in women at the menopause can readily be explained by the overlapping of the two phenomena in a coincidental age group, rather than by any causal relationship.

"Alvarez and Zimmerman[3] analyzed 1,230 hypertensive women's menstrual and sex histories, taken with the possible endocrine relation in mind. They found that hypertensive women showed a much higher incidence of sexual abnormalities, such as uterine fibroids, masculine distribution of hair and sexual anesthesia, as compared with women having normal blood pressure. They believed this evidence supported the theory that arteriolar hypertension is a bodily pecularity inherited equally by boys and girls, but ordinarily suppressed in women before the menopause by ovarian or other related secretions. This would explain why hypertension increases in frequency at and beyond the time of menopause. Also the absence of the female sex hormone in men may be the reason why arteriolar hypertension begins earlier in men.[4]"

For many years hyperthyroid states have been shown to have a tendency to cause an increased blood pressure. The pulse pressure certainly is higher. Ablation of the thyroid in exophthalmic goiter does modify this tendency. In the toxic adenoma we are again entering the age group when both conditions may overlap. Removal of the adenoma does not result in a return of blood pressure to normal. In diabetes mellitus it has been shown statistically that there is a tendency to increased blood pressure. Here, again, the age group overlaps. There is a definite correlation between increased arteriosclerosis and diabetic states. But increased blood sugar has no effect on blood pressure.

Recently, Cushing[5] has emphasized the fact that the pituitary may play a part in hypertension. There are three conditions where there is increased blood pressure in which he has found anatomical changes in the pituitary. These changes have to do with the basophilic cells and their relation to the pars posterior (or pars nervosa). The first is a clinical entity recently described by him as basophilic adenoma (pituitary basophilism). Hypertension is one of the essential disturbances in this condition. The other two are eclampsia and primary hypertension. In these two conditions, an invasion of basophilic cells

from the pars intermidia to the pars nervosa are described. This invasion is indicative of hyperactivity of the posterior lobe. These cells undergo hyalinization in the form of holocrine secretion. This secretion makes its way into the circulation by venous channels or into the third ventricle through the infundibulum. He quotes Anselimno and Page, who found a pressor-like substance in the blood of patients suffering from essential hypertension and toxemias of pregnancy, respectively. The number of observations along this line are rather meager. The cases of basophilic adenoma of the anterior pituitary are rapidly being augmented. Just how the basophilic cells of the anterior lobe get into the posterior lobe, or how their secretion gets into the third ventricle, or the circulation, is still unsettled.

Major[1] has been able to demonstrate increased guanidin bodies in the blood of hypertensives in sixty per cent out of five hundred cases, and in a hundred per cent in chronic nephritis. The substance he has isolated has not been identified. The guanidin bodies so far recognized are creatinin, creatin and arginin, none of which has any effect on the blood pressure. Methyl guanidin, isolated from muscles, is a powerful pressor substance. Several years ago Major suggested that instead of the presence of pressor substance as a cause of hypertension, there may be a lack of depressor substance. Hypertension in that sense might be a deficiency disease, much like pernicious anemia is a deficiency disease. In Von Bergman's clinic, it has been shown that normal individuals pass an unidentified depressor substance in the urine. Whereas hypertensive's urine show little or no such depressor substance.

Mineral imbalances have been sugggested as a cause of hypertension. The calcium-potassium ratio of Kylin and others has been advocated as a cause. These minerals act directly on the muscle cells, causing an increased sensitivity to pressor influence. Westphal's cholesterol theory of hypertension belongs to this type of thinking. He found cholesterol increased in the blood of hypertensives in seventy-one per cent. This finding has been confirmed by me and by others. It is assumed that cholesterol alters the surface tension of muscle cells, thereby changing their reaction to pressor substances. It is possible that in muscle cell physiology, some day, there may be found a simple explanation for essential hypertension.

Many accept the pathogenesis of this syndrome with its definite anatomical variations as another expression of senility. We have accepted atherosclerosis as a manifestation of senility. Arteriolarsclerosis is a similar manifestation in the peripheral areas of the vascular bed.

Symptomatology

The symptoms of hypertension vary considerably, from none whatever to acute, insidious onsets of cardiac, cerebral or renal manifestations. There is a tendency to associate hypertension with the sthenic type of individual. But statistical data do not confirm this. Whereas the usual hypertensive appears to be of a calm, almost phlegmatic temperament, close study of such a person reveals irritability and hyperexcitability. In other words, he is easily upset somewhere by his environment or by his problems. Whether this is a constitutional trait, or a part of the syndrome, is hard to determine. The literature speaks of the hypertensive personality, the reactivity of which is very much like the normal, only more so. Long before there is any manifestation of cardiac, cerebral, or renal insufficiency, symptoms of headache, dizziness, nervousness, fatiguability, lack of concentration, palpitation, dyspnea, insomnia, etc., are complained of. It is not easy to say whether these are due to vascular changes or psychogenic in origin. That some of these have a psychogenic basis, has been definitely shown by Ayman,[6] who gave forty hypertensives ten drops of dilute hypochloric acid for a period of ten days to three months. Thirty-four, or eighty-two per cent, of these cases responded with complete disappearance of the symptoms mentioned above. With improvement of symptoms there was a definite tendency toward a drop in blood pressure. On the other hand, the hypertensive, with his new index of blood pressure, is living in a totally different physiological *milieu* from normal. Obviously, something has been changed in this type of person, which is being registered by these symptoms. The larger bulk of hypertensives are discovered by routine examination. When they consult a physician, it is usually for some cardiac, cerebral or renal manifestation. Sooner or later, one of these three important organs take the center of the stage in the complaints of the patient. In Bell's statistics, sixty per cent die of heart failure, fifteen to twenty per cent of cerebral accident, ten per cent of renal insufficiency. The rest die of intercurrent diseases or accidents.

The early symptoms of cardiac strain, or insufficiency, are fatigue, precordial pain, consciousness of the heart, dyspnea, insomnia. Many suffer from dyspnea long before there are any definite signs of heart failure. Cardiac failure may be insidious, lasting from a few moments to days or weeks. These insidious failures manifest themselves by acute attacks of congestion of the lungs,

or bronchi, which may occur only at night. Some of these attacks are purely cerebral in origin. Dyspnea on exertion may go on to dyspnea at rest with congestive failure, with enlarged liver and ascites. The heart of the hypertensive is usually enlarged, its substrat of failure being in most cases coronary insufficiency or coronary closure. There is a small group who die of pure cardiac fatigue, no evidence of coronary disease being found at postmortem. The symptoms of coronary disease, anginal attacks and coronary closure are so well known that it is not necessary to review them here.

In addition to the cerebral symptoms already mentioned, such as headaches and lack of concentration, transient para or hemiplegias occur. These must be explained on the basis of cerebral vascular spasm. They can usually be differentiated from massive hemorrhages by lack of shock. Some are extremely hard to tell apart. By far the commonest cause of death is cerebral hemorrhage. In addition to the symptoms of hemorrhage, patients may show cerebral manifestations produced by increased intracranial pressure, intense headache, vomiting, marked twitching, or even convulsive seizures may occur. Ophthalmoscopic examination shows markedly choked discs in both eyes. The softenings which occur are due to occlusions of arterioles or by thrombi. They manifest themselves by all sorts of changes in personality, from very mild variations to maniacal states.

When renal insufficiency occurs, it is progressive. The malignant type of hypertensives are difficult to differentiate from true nephritis. To differentiate them by oculi-fundi examinations is sometimes possible, but not always. The albuminuria, nocturia, polyuria are mere symptoms of an arteriolosclerosis. Long before there is marked renal insufficiency, the patient dies of heart failure or cerebral accident. Sometimes dimness of vision, due to hemorrhage in the retinae may be the first manifestation the patient complains of in hypertension. This is usually a late sign. I have seen venous thrombosis occur in the fundus from the pressure of an artery crossing the vein.

One of the striking facts in my observation of this group of patients is that a mild infection often initiates cardiac, cerebral or renal failure.

Prognosis

It is obvious in a syndrome which has such a striking constitutional background, that the prognosis must be sifted out of the family history, plus the state of the patient. Hypertensives with good tubing, so to speak, will last longer than those with poor tubing. Again, in a syndrome in which one person will live the allotted span of years in spite of the increased arterial pressure, and another will quickly succumb to the changed index of pressure, the prognosis requires time and observation. The age of onset is important. It is well known that in hypertension which starts in the earlier decades, the prognosis is bad as compared with that of hypertension which begins after the fifth decade. In the earlier decades, the third or fourth, the malignant type dominates. Women carry their hypertension better than men. That may be the reason it is more prevalent in women than in men. Persons with unstable nervous systems do not do as well as individuals with phlegmatic dispositions. Insurance statistics give us perhaps the best impression of prognosis in hypertension. Muhlberg[7] states that risks with a systolic blood pressure of ten to twenty millograms of mercury above the average, have a mortality of 69 per cent more than the expected, and in those with increase of 24 to 34 millograms, there is a hundred per cent increase in actual over the expected mortality; with an increase of 35 to 49 millograms, 145 per cent, and with an increase of 50 millograms and above, 291 per cent. This gives us an idea of the devastating effects of blood pressure on mortality statistics. Paullin[8] quotes a personal communication of Louis I. Dublin, of the Metropolitan Life Insurance Company, who says: "A recent study shows that among persons with a systolic pressure of 25 millograms or more above the average for age (most cases being less than 45 millograms above the average) the mortality is more than twice the normal and it increases rapidly in the higher pressure." In another study of carefully selected applicants with diastolic 16 millograms to 21 millograms above the average, have a subsequent mortality more than one and one-half times the normal. It was brought out by Muhlberg and Dublin that persons with an increase of 15 millograms or more above the average and who had constant apical systolic murmur and with a slight or moderate cardiac hypertrophy, suffered a mortality three times the normal. No wonder insurance companies are so insistent on pressure readings and back away from risks that carry pressure. Paullins aptly says it would be extremely interesting to know the effect of medical guidance in the prolongation of life in a group of these individuals. My answer to such a query would be that the effect would be none at all.

Usually, the patient appears with symptoms referable to the heart, or brain, or kidney. For the two latter, I see no way of giving a prognosis. For the cardiacs, the prognosis can be approxi-

mated by their response to rest and cardiotherapy. In the group with symptoms still referable to spasm, the prolongation of life should be more favorable than in the cases where arteriolar and atherosclerosis are already present. With blood pressure, 170 to 190 and the diastolic still hovering around 90 or 100, when the functional capacity of the heart is good and there is no albuminuria, when the cerebral arteries are still good and the retinal arteries show little changes, there is justifiable reason to believe that many years of usefulness may supervene. When there is evidence of changes in the arterioles, and cardiac hypertrophy, a history of cardiac breakdown, sometimes a re-education of personality makes prognosis better than in the case where readjustments seem impossible. If we accept hypertension to be a form of senility, then the prognosis is that of senescence and senescence is but the precursor of death.

Treatment

Fundamentally, the treatment of hypertension is the re-education of the patient. There is the group which is frightened by its misfortune in having high blood pressure; the group who resents its visitation, and the group who is indifferent to it. The frightened must be reasurred; the resentful must be admonished to carry their load; the indifferent must be awakened to the dangers of their situation. Personally, since the major number manifest cardiac symptoms, I prefer to explain to them the new index of work their hearts have to do. On this basis, restricted activities become a normal adjustment. The daily noon-day rest is accepted as a routine. This rest is far more important than just resting the heart. It affects the nervous make-up of the patient and has an immeasurable influence on the homeostasis. In the earlier cases, where there is no evidence of arterial damage, either in the kidney, heart or brain, the only restriction of any kind indicated is the daily noon-day rest in a recumbent position. This not only rests the heart, but relaxes the blood vessels, releases the nervous excitement. There is a psychological effect in such a routine that has a far-reaching prophylactic result. In my experience, this simple expedient when accepted and honestly carried out, often changes the personality of the patient to such an extent that prognosis becomes optimistic and a definite assurance of longer usefulness can be obtained. Since in the major number, cardiac symptoms intervene, restricted activities become imperative. If they have gone through the preliminary daily noon-day rest period, the newer restrictions are accepted as a rule. In those of a nervous temperament, the barbituric derivatives almost act like a specific. The fat are reduced in weight. The lean are urged to put on weight. Outside of these two types, diet has no influence on hypertension. The vasodilators are of little use in hypertension except in emergencies, such as vasomotor spasm, anginal attacks, or cerebral symptoms. It is a debatable point whether any attempt should be made to lower the blood pressure in hypertension. It is still more debatable whether the thing can be done. Most of the vaso-dilators act only for a short while. Tolerance to drugs, including cross-tolerance to the nitrates, is quickly established. I have seen temporary blindness and anuria follow the use of spinal anesthesia in experimental studies on blood pressure.

The treatment of broken compensation, anginal attacks and coronary closure are all so familiar and special we need not dwell on them. The renal manifestations need very little attention. In malignant hypertension treatment is similar to that in chronic nephritis. I know of no methods of avoiding cerebral complications except by the above-mentioned prophylactic means, that is, of early instituted daily periods of rest. For the cerebral edema, spinal puncture, hypertonic salt, or glucose solutions may be used. Decompression has been done a number of times with temporary relief.

There is one prophylactic measure that I insist on and emphasize again and again to hypertensives. This is not mentioned in the texts, nor have I heard it mentioned in the numerous discussions which I have heard on treatment. This measure is to avoid infections, particularly upper respiratory infections. As a matter of fact, hypertensives are fairly immune to infections, but when they do acquire an infection, they do not tolerate it very well. They act very much like diabetics with infection. I have repeatedly seen hypertensives who will carry on in an ordinary manner, suddenly topple over with fulminating symptoms, heart failure, renal failure, or cerebral failure, following a mild or severe attack of cold. Judicious rest and education towards equanimity and avoidance of infection are the three prerequisites in treating hypertension.

Much has been written on the prophylaxis of hypertension. Eugenics and a new synthesis of the motivation of life, are mentioned as factors in producing a reversal of this ever-increasing dominant force, which is destroying men and women at an age when they should be most valuable to the community and the social order.

In industrial medicine, particularly railroading, the attitude toward hypertension in employees, should be one of extreme conservatism. No mat-

ter at what age hypertension manifests itself, it should be looked upon as a degenerative process —an expression of senility. Responsibility and senility are incompatible. A policy based on such a conclusion may work a hardship, or even prove unjust in individual instances. And there may be exceptions made. Yet in the long run experience and physiology have proven that such an attitude is fair. If it is carried out consistently it would be one of the important rules which make the implications in the slogan "Safety First" ring true.

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"Granulocytopenia"

(Continued from Page 651)

the agranulocytompenia she had been given two capsules, each containing 2½ grains of pyramidon and 2½ grains of acidtanlid. It does not seem, however, that such small doses could be considered a causative factor in this case.

The only other possible ethological factor was the Vincent's infection of the throat, and this in our opinion was the probable primary cause. It was interesting to note that her blood condition progressed or regressed on a parallel with the condition in her throat.

Although agranulocytompenia is prone to recur this patient has been well since she left the hospital some seven months ago. Her last blood count made on June 8, 1934, showed hemaglobin, 80 per cent; ercythrocytes, 4,000,000; leucocytes, 8,400. She appeared at this time to be in perfect physical condition and had gained back to her normal weight.

We believe that the yellow bone marrow was the best single therapeutic agent used. It was noted, however, that an increase in the leucocytes occurred following the injections of hydrochloric acid, this increase being limited to lymphocytes. Very little response was noticed following the X-ray exposures. In fact, it was felt that it did more harm than good.

The yellow bone marrow should be pushed to the limit and much larger doses may be given than were used in this case. It may be necessary to administer it through the nasal tube if the taste is unpleasant to the patient.

Pregnancy with Unruptured Hymen

(Continued from Page 646)

That impregnation can occur with an intact hymen has been recognized for many years but such an occurrence is very rare.

In the case reported, a 2½ months pregnancy occurred in an unmarried woman 21 years old with the hymen intact. The diagnosis was confirmed by the Friedman modification of the Ascheim-Zondek test.

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Coarctation of the Aorta: Report of Two Cases*

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IN RECENT years the reports of a considerable number of cases of coarctation of the aorta have been added to the literature. Abbott and Hamilton[1] made a very complete study of this pathologic picture, dividing it into two groups, the infantile and the adult. Evans[2] in a more thorough study of the subject, further divided the adult group into several types, depending on the point of the atresia of the aorta. He has evidence that this condition depends on a maldevelopment of the bronchial arteries which locates the point of atresia.

The two cases reported here are of the adult group and belong to the type where there is an atresia of the aorta close to the insertion of the ductus arteriosus. There is no evidence of a patent ductus arteriosus in either case.

Case 1. (S.M.R.). A white male 23 years of age who had his entrance physical examination at the Health Service in September, 1929. Except for the presence of a simple goiter the examination was entirely negative. The blood pressure was recorded as 120/96. On April 17, 1933 he came to the Health Service because of an inability to get life insurance on a basis of a hypertension. He presented a letter from his examining physician which in part is: "I examined the patient in April, 1931 when he complained of nervousness and tachycardia. A basal metabolism test was +10%, the blood pressure at this time was 160/80. The blood sugar was 110 milligrams. In December, 1931 the blood pressure was 110/80. I saw him again on March 3, 1933. The pulse was 90, the blood pressure in the right arm 170/100, in the left arm 120/100. On March 4, 1933 the blood pressure in the right arm was 160/70, and in the left arm 100/90. There was some enlargement of the neck but a metabolism test was not taken. The urinalysis was negative.

When examined a tentative diagnosis of coarctation of the aorta or pressure from a cervical rib was made from the above letter. The blood pressure in the right arm was 178/90; the pressure in the left arm and legs was not obtainable. There was no pulsation of neck vessels. An X-ray which was taken showed the characteristic changes found in a coarctation of the aorta. He has been seen several times since and the blood pressure has varied in the right arm from 178/90 to 210/100; in the left arm from 108/92 to 120/90. The electro-cardiogram is normal.

Case 2. (P.D.A.). A white male 18 years of age had his entrance physical examination at the Health Service in September, 1932. At this time he gave a history of inflammatory rheumatism at the age of 14 years. He was 21 per cent underweight and had a blood pressure of 198/98 with a diagnosis of aortic insufficiency. He was observed on several occasions in the Health Service with only the above diagnosis. On February 2, 1933 because of an acute tonsilitis he was admitted to the Student's Hospital on the Medical Service. On a basis of the abnormal pulsation of the vessels of the neck and pulsation of the intercostal vessels, a tentative diagnosis of coarctation of the aorta was made. The blood pressure in the right arm was 180/80, and in the left arm 190/90. The pressure in both lower extremities was 100/80. The X-ray examination showed a moderate cardiac enlargement of left ventricular type, and scalloping of the ribs typical of coarctation of the aorta.

An attempt to determine the incidence of this condition in the student body was made during the course of the entrance physical examinations at the Health Service in September, 1933. A group of 150 students, picked at random, had their blood pressures taken simultaneously in both arms, and all other students showing a hypertension were thoroughly examined. In none of these were we able to demonstrate this abnormality.

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The Baffling Commonplace: Migraine*

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CULPRITS in common, in the mansions of the rich and the cottages of the poor, afflicting king and peasant, the intellectual and the illiterate, migraine and epilepsy since antiquity have been known yet unknown. Few clinical entities throughout the history and literature of medicine have been so definitely and certainly recognized as migraine and epilepsy and yet remain so unsatisfactorily and incompletely understood or treated.

In bringing migraine to your attention at this time, I am doing so because it is in the specialties of ophthalmology and rhinology that the vast majority of such cases is first seen.

The popular belief that migraine, or sick headache, is due to eye-strain got under way partly from the writings of George M. Gould in the eighties and nineties of the last century. Gould, who was a prolific writer, believed firmly that eye-strain was the chief cause, and the general profession accepted it rather universally. He was also an enthusiastic champion of competent refraction, and his success in helping many severe cases of migraine served well to spread this confidence. In considering migraine from the psychic aspect, it is interesting to know that this same writer called migraine "The sensory analogue of epilepsy."

During the rapid development of clinical rhinology, following Zukerkandt's work on the accessory sinuses of the nose, the rhinologists put forth the very justifiable claim that migraine, in a large portion of cases, resulted from nasal and nasal-sinus conditions.

The fact is that both the ophthalmologists and the rhinologists were right in their contentions, and with them many others in various branches of clinical medicine in ascribing yet different conditions put forth as the cause of this distressing malady.

Henry Alsop Riley's report of the exhaustive survey of the literature on migraine covers 115 pages, including nineteen pages of bibliography, in the November, 1932, Bulletin of the Neurological Institute of New York. It leaves the reader, as it does the writer, with the distinct realization that by the usual, modern measurement of our understanding of the pathology and the solution of the mechanism involved in migraine we are but little advanced in many centuries.

One is made to feel, also, that far too many other clinical states and conditions, in more recent years as well as in ancient times, have been encircled and coupled as a part or phase of migraine. Many such conclusions have been immoderately speculative. In fact, much if not all of the recognized pathology in such cases at autopsy has been that of definite, separate pathologic entities, and includes organic disease of the nervous system, tumors of the trigeminal nerve and brain, hydrocephalus, tabes, cerebral inflammation and edema with intracranial pressure. Many functional disturbances, too, have been included, questionably, as part of the symptom-complex of migraine, such as intestinal disturbances, nervous diarrhea, spells of extra systole of the heart, polyuria, and many others.

Because of its chief and most dramatic clinical symptom, headache, Riley points out that migraine has been one of the earliest chronicled of human ills, and gives definite references of the writings of early observers as far back as the first century of the Christian era. The names given to this symptom-complex have been consistently the same throughout the ages. Galen, in the second century, gave it the name hemicrania, and that, with but few slight alterations, has endured down to migraine of the French. From Roman and Byzantine history and through the Middle Ages it would appear that observation and familiarity with migraine continued unbroken. Even up to the Renaissance, as indicated by Arabian transcriptions, little or no advance seems to have been made in the knowledge of this malady, and during the period of the Renaissance little or nothing more was achieved.

Most authorities agree that Tissot, in the latter part of the eighteenth century, started by his writing the first scientific study of migraine. At this time vascular causes became considered. Plethora and anaemia led in time to vasomotor understanding and, drawing further on the history given by Riley, it was about the middle of the last century that Du Bois-Reymond put forward the theory of the sympathetic nervous system control of angiospasm and its counterpart,

*Read before the Minnesota Academy of Ophthalmology and Otolaryngology, May 12, 1934.

angioparesis. The inclusion of migraine in the classification of convulsive states soon followed and, continuing up to this time, the parallelism of migraine with epilepsy in many respects is universally dwelt upon by many, if not most, writers.

Many definitions descriptive of migraine have been put forward, and while it would seem all must of necessity prove incomplete and unsatisfactory until some pathology, at least, is determined, it seems to me that the many definitions could be improved by adding that migraine is the manifestation of overload in a leaky, poorly insulated nervous system.

The hereditary characteristics of migraine through generation after generation have been most striking. The neurotic diatheses, including convulsive disorders, psychoneurotic and twilight states and micropsia closely approach petit mal equivalents. The contributions of Maersch at Rochester on this aspect of migraine have been interesting, and it is in this particular sphere that the study of migraine has been most fascinating. Hallucinatory and illusionary states, as well as major hysteria, have been frequently recorded.

The regular periodic recurrences are well recognized, although the attacks may be followed so closely one by another that a status of hemicrania may persist. While migraine is seen mostly in persons of the age of puberty to forty, yet it is not at all uncommon to see it begin in children under ten and continue uninterruptedly into youth and adulthood. Most of such cases are definitely hereditary from the mother's side, in which sex, statistics show, it is more prevalent.

Mental workers of sendentary habits, living in the turmoil of the city, suffer from migraine more than the rural population, who take their time in filling their daily schedule.

All kinds of causes have been given for migraine, including eye-strain, mental fatigue, unexpected and emotional strain.

The prodromes of an attack of migraine are most interesting, and scale from almost-nothing-to-be-noticed up to the most definite and striking aura, almost comparable to those of grand epilepsy.

One of my own patients, a medical student of keen mentality and observation, has an aura in the form of a definite muscular manifestation in his right arm, which has been constant for years. A correction of myopic astigmatism has very much relieved him.

In other instances the expressionless facial appearance would suggest strongly petit mal. One such that I observed was accompanied by a momentary halt in his cerebration and speech, and would most positively impress one as petit mal if these seizures were not regularly followed by scintillating scotoma, a wet, leaky skin, one-sided headache and vomiting.

Patients of this type may experience spells of easy fatigue and dulled mentality, preceded and immediately followed by their usual mental alertness. The headache may be of any of the various types; occipital, at the nape of the neck, or at the temporal or malar region instead of the typical hemifronto-parietal. These patients at such times may present the picture of shock—pale, profuse sweat, too weak to stand, speechless and dazed, with dilated pupils, bilateral ptosis, profuse salivation—the angiospastic type, easily resembling epilepsy. In fact, except for the history and observation of the case, the differentiation from that of petit mal could be very difficult.

The vomiting of such cases is often the most violent retching, from which one could expect conjunctival or even retinal hemorrhage. Most commonly such distressing train of symptoms, leading up to sheer exhaustion, is followed by a short nap of deep sleep, from which the patient awakes completely relieved and ready for his usual routine of duties.

Angioneurotic edema of the hands or other parts of the body, with vasomotor nose symptoms, urticaria and dermographia, is seen in some rather unusual cases, while sudden diarrhea and polyuria are commonly seen. Heart disturbances such as extra systole and even angina pectoris-like disturbances, are seen in middle life and, of course, may be actually coincidental.

Motor symptoms such as twitching, clonic contractions, aphasia, agraphia, temporary hemiparesis, are so strikingly similar to epilepsy that often one may feel like thinking there is little use of attempting to differentiate migraine from epilepsy; that after all they are one and the same functional condition, different only in some specific manifestation and degree of severity. Included, too, in this functional complex, hysteria may well be annexed, for paresthesias, hyperesthesias, and other sensory disturbances, are common transitory manifestations of severe migraine, including definite visual and auditory aphasia with vertigo and tinnitus.

I think it is now very universally acknowledged that any source of prolonged or excessive nervous irritation in a patient with a poorly insulated nervous system will precipitate the symptom-complexes of migraine or epilepsy. I think a very appropriate way of portraying the mehcanism involved in these two maladies is to picture them in

a comparison between a well insulated and a poorly insulated electrical switchboard.

An electric current of the usual and ordinary load confines itself very well to its intended avenues just so long as the insulation is sufficient to hold it or the load of current is not too heavy for the insulation provided. Just as soon, however, as this balance is no longer possible in a given switchboard, there is no longer a confinement of the current to its regular or intended avenues or pathways, and a general short-current disorganization of overflow is brought about corresponding to all the disorganization in the nervous systems of migraine and epilepsy patients, such as motor, sensory and psychic irregularities, perversions and even temporary cessation.

The disturbances of the special senses are, of course, most noticeable. Including the above-mentioned aural disturbances of vertigo and tinnitus or even temporary abridgment in hearing, the visual phenomena are flashes of light throughout the entire visual field and floating areas of obscuration of vision. Hallucinations of sight, micropsia and various disorganizations of the accommodation function may so terrify the victim as to bring about abject prostration. Gustatory disturbances, giving rise to an alarming sensation of false tastes, also distress the patient. Equilibrium disturbances may arise from cerebellar or labyrinthic disorganization and result in difficulties in standing or walking.

The frontal lobe or psychic manisfestations of migrainous disturbances include much of the most interesting study of migraine. Psychic activity may be retarded, diminished or even temporarily held in abeyance. Memory confusion of names, numbers, crossing or confusion of ideas and events, almost resulting in apparent stupidity, is of great humiliation to the patient after he is straightened out, but may last from a few minutes up to many hours or even a few days.

The sequelae and termination of migraine are so coupled with what may be coincidental or concomitant organic and pathologic entities that it is unsafe to risk definite statements in this respect. Permanent changes in ocular movements, accommodation, visual fields, and in other special sense functions, as well as in psychic functions, are numerously recorded.

An elaborate accumulation of data in the matter of visual field changes, with extensive text and field chart tracings, was published some years ago which, though I remember it definitely, I have been unable to locate, as a result, probably, of an unrecognizable title in the references I have searched. The very competent author of that masterly prepared article showed field charts by the score of what appeared progressively changing visual fields in a great many migraine patients who had been under observation for long periods of time. This proposal, too, of course can be very much qualified by being subjected to the same proposition of existing coincidental and concomitant pathologic entities. However, it was a remarkable piece of work, and I should have liked to have found it for more deserving discussion.

One theory as to the sequelae and termination of migraine cases is that of the vascular element, such as arteriosclerosis, etc. At any rate, many of the symptoms of migraine regress with age, and, while premature old age is considered frequent in these cases, yet apoplexy and like terminations are also frequent in patients who have never had migraine.

One marked and outstanding difference in migraine and epilepsy as to sequelae and termination is to be admitted, and that is that, while migraine may bring on premature old age and an apoplectic end, yet it is at least very different from the psychic deterioration of major epilepsy, which most frequently goes into rather early dementia, while the usual migraine patient retains his mental capabilities up to nearly the physical break-up of his life.

Many types of migraine are recognized, and here again, I feel sure, on account of the lack of pathologic differentiation, many separate and unrelated conditions are encircled and included erroneously.

The common type, or ordinary, uncomplicated migraine, is recognized almost universally, and presents slight or transitory scintillating scotoma, one-sided headache, nausea and sometimes vomiting, with no sequelae.

The ophthalmic migraine type presents the symptoms above enumerated, but with outstanding visual disturbances such as definite central scotomata, shimmering in peripheral field, flashes of light, migrating, cloudy areas in the fields of different hue in the two eyes, but of homonymous distribution. The description of visual distortion corresponds to the appearance of heat waves off a hot pavement. The scotomata may be relative or absolute, may be central or paracentral. Headache follows, cold sweat, dilated pupils, shock, great weakness and prostration. Micropsia may be definitely described by the patient during his prostration and may, in severe cases, include twilight state with minor convulsive seizures.

The type classified as ophthalmoplegic migraine probably encircles many separate clinical states that should not be called migraine. Riley points

out that in those cases which came to autopsy many definite pathologic conditions were demonstrated that would account for the third-nerve pareses and accommodative disturbances which years later ended in permanent paralysis. Charcot recognized this type, and no doubt it was considerably overdone, for autopsy in some cases showed localized pathology in and about the origin of the third nerve or along its path. Other cases ending in facial palsy, paresis of the tongue and gustatory disturbances, were found to result from definite pathology involving the respective cranial nerve origins or paths. So long as the pareses are transitory in cases of this type, their inclusion as migraine cases seems permissable, but it is justifiably challenged in the advent of a permanent paralysis where autopsy can be expected to show acceptable pathologic cause for such paralysis.

The abdominal crises type generally includes thoracic disturbances. With the abdominal pain, nervous vomiting and nervous diarrhea, paroxysmal tachycardia, with air-hunger, deep breathing and precordial distress and apprehension appear. No doubt in this group, as a result of a lack of recognizable pathology, many outside and separate clinical states may be masked and unrecognized in including them as cases of migraine.

From the psychic aspect of migraine Moersch, in the American Journal of Psychiatry, Volume 3, 1924, reviews a thousand cases seen in the Mayo Clinic, fifteen per cent of which had mental symptoms. He states that Hall, in 1849, first recognized the psychic relationship of migraine in calling attention to the stupor, delirium and unconsciousness in such patients. Lieving, in 1873, wrote of the emotional and intellectual disorders closely paralleling epileptic equivalents. The migraine constitution and migraine character of heredity became recognized.

Without even any thought of epilepsy, many parents and families have been familiar with so-called spasms of infancy. Such children, later, are troubled with nightmare and more rarely with somnambulism and cyclic vomiting, which finally takes on the more complete picture of migraine. These children, when old enough, remember and describe the hallucinatory phases of their sickness.

I know of one child under ten years who described perfectly the micropsic hallucination of his semidelirium, reasoning at the same time that what he saw was not true. He describes now, as an adult, the diminutive objects that appeared—"so small and so far away"—in his bedroom during the hours following the sick-headache attacks during his childhood.

Moersch points out how some phase of the so-called migraine constitution involves the entire life cycle of the patient; short, abrupt periods of apathy, dullness, lack of customary energy, with decided tendency to worry and a feeling of impending disaster; exaltation and depression, denoting an unstable nervous system; transitory psychoses, hallucinatory, visual, gustatory, olfactory and sensatory, including aura such as numbness of the tongue and motor aura such as muscular spasm in the hand or arm, even to the extent of hemiplegia.

Some patients describe an inhibitory confusion, so unexplainable afterwards, which then is of such easy solution as to seem ridiculous.

Finally, as to major psychic conditions met in patients of severe migraine manifestations, Moersch mentions changes in personality and various psychic equivalents. Acts of compulsion, outbalancing inhibition, are enumerated. Dual personality and even prolonged amnesia are recorded.

However, by far most psychic disturbances in migraine patients are but semidelusionary or semihallucinatory states, the patient being conscious of them but realizing at the same time that they are false; in other words, a twilight state.

Many theories have been put forth as to causes of migraine. Riley discusses eight different theories that have appeared in the literature, viz: (1) The reflex theory, (2) the central theory, (3) the allergic theory, (4) the duodenal stasis theory, (5) the hypophysial theory, (6) the toxic theory, (7) the endocrin gland theory, and (8) the vasomotor or vegetative nervous system theory.

The first, or the reflex theory, is to my notion the most acceptable, and fits perfectly the proposition that an irritation, especially prolonged irritation, leading to an overload in a relatively poorly insulated nervous system, results in a disorganization in that nervous system recognized as an attack of migraine.

The central theory is based upon the proposition of the existence of a local or general intra cranial pressure, the result of embarrassed or interrupted flow of cerebrospinal fluid. Arthur Schuler, of Vienna, adhered firmly to this theory, and assembled large numbers of x-ray pictures of skulls of migraine patients showing deepened convolution indentation in the inner table of the skulls of these patients, which he contended proved the existence of prolonged intracranial pressure. The relief from headache upon spinal puncture in some such cases is held up as proof of this theory.

The allergic theory is based upon the proposi-

tion that a high percentage of migraine patients are allergic cases, forming a basic similarity in many diseases such as asthma, hay fever, eczema, urticaria; and further upon the fact that many such migraine patients were relieved of attacks by elimination of the food poisons or specific allergens.

The duodenal stasis theory proposes as a cause of migraine that dysfunction of the duodenum and its associated glandular organs is productive of faulty digestive and chemical substances that poison the nervous system and thus precipitate migraine attacks.

The hypophysial theory is based upon the belief that transitory swelling in the hypophysis causes the headache, shock, and by pressure upon the cavernous sinus region produces the ophthalmic and ophthalmoplegic types of migraine; that according to the side most affected the unilaterality of the symptoms might be explained. Attention is particularly called to the symptom-crises in cases of acromegaly, and the various visual disturbances are explained by the anatomical proximity of the hypophysis to the optic nerve divisions.

The toxic theory sets forth the idea that toxic products of faulty metabolism are responsible for migraine.

The endocrin gland theory is linked with the theory of vegetative nervous system irregularities as a cause of migraine.

The vasomotor or vegetative nervous system theory is based upon the proposition that cerebrovascular disturbances are responsible, such as hyperaemia and congestion or anaemia and vascular stasis; in other words, vascular dilatation or vascular constriction.

Much work in metabolic and biochemic investigations has been done upon the urine, the blood, spinal fluid, basal metabolism and blood pressure, by many disassociated observers without any satisfactory or convincing result. Considerable skull radiography has failed, except in the case of Schuler's work, to bring forth anything of value.

The pathology in migraine as afforded in postmortem findings has been meager, but in a few cases of authenticated history of definite record, including major migrainous manifestations such as aphasia, homonymous hemianopsia, transitory paresis, total analgesia, twilight sleep, delirium, etc., autopsy showed only unspecific changes such as brain atrophy, internal hydrocephalus, fatty degeneration and pigmentation of the basal nuclei. and the general increase in new arterioles sometimes seen in arteriosclerotic areas.

In other cases of well recorded migrainous history, autopsy showed tubercular disease, brain tumors, gummatous processes, all of which were, of course, of intercurrent but not significant pathology. Three others of ophthalmoplegic migrainous history showed localized pathology of and about the third nerve nucleus and tract or aneurysm in that region.

The treatment of migraine, other than symptomatic, rests, of course, upon diagnosis by exclusion. To rush in and take for granted that all cases of migrainous symptoms are truly migraine would lead to abundant tragedy. Like the blanket diagnosis, in the olden days, of rheumatism, syphilis and hysteria, before modern knowledge of focal infection, serological tests and the development of psychiatry and neurological diagnosis, a large portion would at autopsy prove to be of other definite organic pathology. Brain tumors and obscure inflammatory diseases in multitudes have gone to fatal termination, unrecognized, as accepted migraine cases. Migraine, like hysteria, should be the last diagnosis accepted after exclusion of every other possibility.

Riley, in summarizing his survey, points out the almost unbelievable lack and want of scientific investigation that migraine has had; that its pathology presents an almost virgin field; that an immense amount of dead-house material has gone by without an attempt to make the most of it; that what has been reported has been of a most superficial character. He believes that the chief opportunity for study lies in investigation of the internal secretory glands, especially the hypophysis, also the role of vasomotor apparatus and of the cerebrospinal fluid in its hydrodynamics, and that the biochemic and metabolic aspect of investigation of migraine, on account of its neglect up to this time, affords great opportunity.

Riley's tremendous task in this magnificent survey of the literature was made possible by funds provided by the Josiah Macey Jr. Foundation, with the hope, it is to be assumed, of gleaning from the world's records some things that would contribute to the relief of suffering in this strange malady. His tenacity of purpose in grinding through this mountain of source-material should be thoroughly appreciated when we realize that no encouragement, from beginning to end, was unfolded in the way of known or promised relief.

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MINNEAPOLIS, MINN., OCTOBER 15, 1934

THE HEALTH OF COLLEGE STUDENTS

Registration figures which are appearing for colleges and universities seem to indicate that more young men and women than ever before are seeking education on a collegiate level. For the last two or three years college and university enrollments were on the decrease; hence, the very large increases reported this year are surprising. Doubtless many of these students were unable, for financial reasons, to continue their education for the past several years; but now, with more optimism, and we hope with more money, they are flocking back to school.

The need of these students for health service is greater now than in prosperous times; but educational budgets have been terribly reduced. This means difficult problems for health services financed out of educational funds. To those whose budgets come from student fees the increased enrollment means added opportunity. In any case, however, the quality of the service offered must not be permitted to suffer. It should always be at least as good as those responsible would wish for their own sons and daughters attending college away from home.

How extensive should be this service which a college offers must be determined by local conditions; but clearly the first responsibility of college health services lies in the field of prevention and health education. In the medical care of students the local practitioners can render valuable assistance, either as part-time members of the health service staff, or as private practitioners co-operating with the department. Correction of physical handicaps is properly considered a responsibility of the individual student or his family; but in certain cases serious handicaps go uncorrected unless the health service renders some assistance in this field also.

In no case, however, should health services extend their activities beyond what they can do well, and on every possible occasion they should co-operate with family physicians and local practitioners in the medical care of students. Operated on such a basis, college health services today have a unique opportunity for constructive, interesting, and worth-while service.

H. S. D.

SYRINGOPRAXIS

Rather strange, is it not, that a new cult did not spring up heralding the advent of modern syringopathy?

In the not so distant past the syringe was used to administer clysters to the rectum, douches to the vagina, injections to the urethra and wash out ears; and only on occasions of great urgency did it's sharpened prick get under the skin to supply speedy narcosis or stimulation.

Now the syringe is used more than any other instrument in the hands of the physician, for both

diagnostic and therapeutic purposes. Bismuth paste is forced into longstanding tortuous sinuses. Lumbar puncture is performed and the ventricles of the brain are stabbed without hesitation, inoculations of serums and vaccines and antigens are made. Veins are entered to withdraw blood for diagnosis or to supply medicines in a more-quickly absorbable way, or indeed to promote local coagulation, as in cases of varicosities. The surgeon uses local anesthesia more and more before operations, and hypodermoclysis and enteroclysis afterward; the pediatrician introduces salines into the peritoneal cavity, the proctologist injects hemorrhoids and the herniotomist is beginning in many cases to substitute the syringe for the knife.

Paracentesis has been practiced for a long time, especially to evacuate fluids, but collapse-therapy is modern and already a commonplace procedure, and so tuberculous pulmonary tissues may now be put to rest and healed.

It is clearly apparent that the modern physician must maintain a considerable assortment of instruments of this kind. And, since one of the most important working-tools of the profession is at times entrusted to insulin-requiring patients for self-administration, due and respectful emphasis should be placed upon the dangers of its careless and improper use. Physicians are learning the value of a new needle for each operation. Needle-wire patency does not assure a clear flowing lumen and that after all is the actual requirement of successful work.

A. E. H.

CHRONIC LEAD POISONING

In a recent contribution (Guthrie Clinic Bulletin, vol. 3, no. 4, p. 136), Conklin and Langley make the interesting observation that whereas lead poisoning resulting from the use of water conducted through lead pipes is perhaps a rarity today in our urban communities, its occurrence in rural sections is more common where the source of water is either a spring or a well and lead pipe, due to its malleability, offers an easy and convenient mode of conveyance. Situated when one is in an extensive agricultural area the possibility of plumbism in its chronic manifestations must constantly be borne in mind.

It is not only that it can easily be overlooked if not kept in mind, but unfortunately it is a condition which when misdiagnosed may lead to an unnecessary operation. Hayhurst (Report of Comm. on Indust. Diseases, Illinois, 1911) found five cases among young workers in litho-transfer papers for decorating pottery and of these two had undergone appendectomy because of mistaken diagnosis and one of these had double wrist drop, double ankle drop and amenorrhea. Alice Hamilton (Industrial Poisons in the U. S., p. 202, 1925) saw a young artist suffering from lead poisoning who had been urged by three physicians to have his appendix removed and a friend of his, for many years in the trade, had undergone four abdominal operations before the real nature of his trouble was made manifest by a double wrist drop. Such mistakes are not so apt to happen in lead poisoning among industrial workers, for the hazard here is recognized and one is more or less on the look out for it. But in the so-called "accidental" cases, and the farm cases come in this category, plumbism may easily be overlooked by not being thought of and a disastrous error occur. On the other hand, if kept in mind, it may, as Langley says, frequently solve the cause of a baffling secondary anemia, explain the origin of an obstinate group of joint and muscle pain or determine the source of recurrent, aggravating colicky abdominal pain.

The diagnosis is not always easy. The colic is probably the most constant symptom and an early one, but the characteristic "blue line" may be absent and the basophilic stippling may be encountered in any severe, chronic anemia. Kilduffe (Clinical Interpretation of Blood Examinations, p. 202) says that its diagnostic value in lead poisoning depends not upon its presence but upon its degree. The encephalopathy, peripheral palsies and arterioslerosis are secondary manifestations and frequently absent. None of the symptoms alone make a diagnosis, but when they occur in combination and the poisoning is definitely traced to its source the picture is complete.

Fortunately there is no feature of the diagnostic signs which is beyond the ability of a competent physician to evaluate. It is only when this rather unusual condition is not thought of and given proper consideration among the possibilities that mistakes occur.

G. C.

NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. F. N. Grose, Clarissa, Minn., was recently married to Miss Esther Saevig, of Rushford, Minn.

Dr. L. W. Pence a former Sioux Falls physician, died at Milwaukee recently from a sudden heart attack.

Dr. E. T. Shortt, formerly of Waukon, Iowa, has moved to Stanton, N. D., where he will continue general practice.

Dr. Fred Foley, St. Paul, was the guest speaker at the September meeting of the Medical Society held at Brookings. S. D.

Dr. R. A. Curtiss, a University of Minnesota graduate, has become associated with Dr. J. J. Kolars, at Le Center, Minn.

Dr. M. M. Hursh has closed his office at Grand Rapids and moved to Cohasset, Minn., where he will continue his general practice.

Dr. E. J. Schwinghamer has opened offices for general practice at Wolverton. The doctor was formerly located at Benson, Minn.

A new community hospital has been opened at Richardton, N. D., with Dr. C. R. Dukart, formerly of Dickinson, as superintendent.

Dr. George H. Spivey, formerly of Williams, Ariz., has been added to the staff of the Battle Mountain Sanitarium at Hot Springs, S. D.

Drs. W. C., J. C. and N. W. Fawcett have formed a medical partnership and will have offices located at both Devils Lake and Starkweather, N. D.

The hospital that was recently constructed at Fort Peck, Mont., was destroyed by fire with a loss of nearly $75,000, all of which was covered by insurance.

Dr. J. A. Myers, Minneapolis, was the guest speaker on September 17-18-19th, at the Rocky Mountain Conference on Tuberculosis, at Colorado Springs, Col.

Dr. E. P. Lyon, dean of the University of Minnesota Medical School, was a guest speaker at a dinner meeting of the Riverview Commercial Club, St. Paul, this month.

Dr. W. L. Forester of Minot, N. D., has purchased the practice of the late Dr. E. M. Burke, at Havre, Mont., where he will specialize in eye, ear and throat practice.

Dr. W. A. Fansler, Minneapolis, presented a paper "Office Treatment of Rectal Diseases" before the members of the Renville County Medical Society, at Olivia, Minn., last month.

Dr. E. M. McLaughlin, Winona, Minn., has recently returned from a 12,000 mile trip, traveled by automobile, steamer and airplane, which covered Canada, New Mexico and Arizona.

The Black Hills Medical Society held their last meeting on Sept. 20, at Sanator, S. D., with Dr. J. A. Myers, Minneapolis, being the principal speaker. His topic was "Childhood Tuberculosis."

The annual meeting of the Minnesota Trudeau Medical Society was held at St. Paul on the evening of October 6. Dr. E. S. Mariette, president and Dr. R. D. Hastings, secretary. Dr. W. J. Marcley, Minneapolis, was the principal speaker.

Dr. A. R. Thompson, formerly of Raymond, has moved to Cokato, Minn., where he will continue his practice. The doctor has purchased the hospital and is making extensive improvements on the same.

The North Dakota State Nurses Association held their annual meeting at Jamestown this month, with a large attendance, and a very interesting program being presented for the three days' session.

Dr. T. D. Jones, Bowdle, S. D., has taken charge of the Community Hospital and many improvements and modern equipment are being installed. Miss Althea Blumhardt, R.N., will be the head nurse.

Dr. O. G. Linde, Thief River Falls, Minn., had the misfortune to lose one of his legs recently, while duck hunting, his gun going off accidentally. Two operations were performed in order to save his life.

Physicians from all sections of the United States are holding a three-day session this month at Rochester, being the sixteenth annual meeting of the association of ex-resident physicians of the Mayo Clinic and Mayo Foundation.

Thirty thousand dollars in new equipment and modern improvements in the buildings are being made on the St. Joseph's Hospital, at Brainerd, Minn., which will make it the most complete hospital in that section of the state.

Dr. J. L. Schoch, New Ulm, Minn., died re-

cently at his home in that city, after being confined to his bed for many months. Dr. Sckoch was a prominent figure in medical and business circles during the past forty odd years.

The Minnesota Nurses Association held its annual meeting at Duluth last month with a large attendance of members. Miss Liela Halverson, St. Paul, was elected president and Mrs. Beulah Rhinow, Minneapolis, secretary.

The physicians of Grafton, N. D. were hosts to the members of the Grand Forks Medical Society last month, with Dr. J. E. Countryman in charge of arrangements for the banquet. Dr. M. B. Ruud, is president of the Grafton society.

Dr. E. W. Hammes, who has been in active practice in St. Paul and vicinity for over 40 years, died this month at St. Joseph's hospital. Dr. Hammes has been ill for many years and retired in 1929, being greatly missed by his many patients.

At the September meeting of the members of the Mower County Medical Society held at Austin, Minn., two interesting papers were presented. Dr. W. D. White, Minneapolis, on "Fractures of the Lower Extremities," and Dr. M. C. Piper, Rochester, on "Treatment of Salpingitis."

The first fall meeting of the Yellowstone Valley Medical Society, was held at Billings on September 28, when committees were named to plan for the annual state medical meeting, that will be held here next July. Dr. E. G. Balsam gave a complete report of the last annual meeting held at Helena. Dr. J. I. Wernham presided.

More than 100 physicians of the state gathered for the university's annual two-day medical short course at the University of Minnesota. Recent progress in the procedure and improved technique in the diagnosis and treatment of cancer, diabetes, heart disease and tuberculosis, the four principal causes of death, and the fracture, were studied by the physicians.

A number of Minnesota doctors took part in a "health court" on the health hour program at the annual meeting of the Minnesota Federation of Women's Clubs at Fergus Falls, Oct. 3. The health hour was given under the auspices of the Minnesota Public Health Association. Dr. E. A. Meyerding, St. Paul, executive secretary of the association, presided.

By invitation of the New York Academy of Medicine, Dr. Charles N. Spratt, Minneapolis, will demonstrate his operations for "Glaucoma and Cataract" by means of motion pictures. He will also read a paper on "The Closure of the Cataract Incision" at the Boston meeting of the College of Surgeons and another paper on "Glaucoma" at the meeting of the Pennsylvania State Medical Society at Wilkes-Barre.

The regular fall meeting of the Yankton District Medical Society was held on the evening of September 21, 1934. There was the usual fine dinner, there being about sixty at the table, which included the Ladies' Auxiliary and visitors. The guest speaker at the scientific program was Dr. J. A. Bargen of Rochester, Minn., who spoke upon the subject "The Management of the Various Types of Colitis," with lantern slides. The discussion of the foregoing was opened by Dr. E. M. Stansbury of Vermilion. The second number was a report of a case of "Thymoma" by Dr. F. J. Abts of Yankton. Dr. J. C. Ohlmacher, state pathologist, of Vermilion, talked upon the "Pathology of Thymoma," showing a number of gross pathological specimens of the same. Seven new members were voted into the society. The senior medical students of Vermilion were in attendance.

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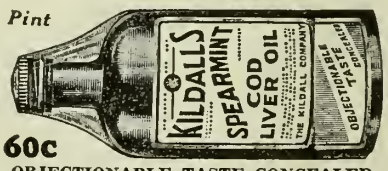
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The JOURNAL LANCET

Minneapolis, Minnesota
November 1, 1934

New Series
Vol. LIV, No. 21

The Results of the Use of Certain Vaccines and Anti-serums in the Immunization of Children Against Some of the More Important Contagious Diseases*

William H. Park, M.D.
New York City

THE DISCOVERY of diphtheria antitoxin put in our hands a means of protecting children against diphtheria by passive immunization. As the antitoxin was necessarily produced in horses the passive immunity developed by the introduction of the antitoxin into the tissues only lasts from ten days to four weeks. The duration of the immunity depends on the amount of antitoxin administered and somewhat upon the tissue characteristics of the individual treated. The usual dose advised is 1,000 units for a child. It is given subcutaneously. This will give an immunity in every child for at least one week and usually for three weeks. If the danger of infection remains, a second injection may be given at the end of ten days. The duration of the immunity will be shorter after the second injection, however, because of the sensitization of the child to the horse antitoxic globulin. There is a very slight danger from the horse globulins. The fatalities are about one in 60,000 of those injected.

Active Immunization

Toxin-antitoxin was used in the immunization of horses before it was used in children. In 1914, Behring tested its value in a small group of children. The war prevented his continuing his experimental work. With Zingher's help I began its use in New York City. We found it effective. Later I found it possible to improve it. This preparation is still largely used in the United States. Three doses of 1 cc. each given at intervals of one or two weeks are advised.

The success of the attempted immunization depends on the potency of the product. With a fresh preparation, at least 80% of Schick positive children should become Schick negative. Children at any age above three months are suitable for immunization, but usually the period between an age of six months and 12 months is chosen, since children under nine months are usually immune when born in the cities and about 50% when born in the country.

The intervals between injections should be at least one week, but if it is convenient two or more weeks are advisable. For the past few years a preparation of diphtheria toxin treated with .4% of formalin called toxoid is replacing toxin-antitoxin. This toxoid has no toxic action and is more potent than toxin-antitoxin. A single dose of 1 cc. of a preparation having 15 or more antigenic units is as good as three doses of toxin-

*Prepared especially for THE JOURNAL-LANCET.
During the past 20 years the immunization of children against a number of contagious diseases has been accomplished. The results in the most important of these are briefly considered in this paper.

antitoxin and two injections will give about 90% to 95% of success in children.

Within the past two years it has been found that if the toxoid is precipitated by adding to the fluid 1½% to 2% of alum and this precipitate is washed and suspended in salt solution it becomes a still more excellent immunizing preparation. This precipitate, when injected subcutaneously, requires ten days to two weeks to become absorbed. This slow absorption adds to its immunizing power. A single injection causes on the average 95% of the children to change from a positive to a negative reaction. None of the toxoid preparations causes any annoyance in young children, but in about 5% of older children and adults considerable local reaction may develop. To alleviate these reactions the application of wet dressings of boric acid solution is of great value. Dr. Povitzky in our laboratory has developed another preparation by floculating the toxoid by adding to it a suitable quantity of antitoxin and then heating the precipitate to 80° C. so as to destroy the antitoxin while leaving the toxoid almost unaltered. This is then washed and dissolved and an effective vaccine remains. This is of value in immunizing nurses and physicians who come in contact with diphtheria since it produces almost no local reaction.

The combined effect of the use of antitoxin and toxin-antitoxin and toxoid have been most remarkable. Both the cases and the deaths from diphtheria have diminished greatly. Fifteen years ago the deaths from diphtheria in New York City were about 1,200 and the cases about 14,000. During this last year the deaths have been reduced to 86 and the cases to 1,200. Godfrey has found that when 50% of the pre-school children in communities have been immunized, diphtheria ceases to be of importance. We should remember the baby needs immunization most and is annoyed least by it. In about 80% of the cases a baby which is immunized remains immune for ten years and probably for life.

Immunization Against Scarlet Fever

For some thirty years the toxin of the scarlet fever streptococci has been more or less used for immunization. The first extensive application of the vaccine was made in Russia with excellent results. In 1917 the discovery by the Dicks of the skin test developed an interest in immunization in this country. The toxin for vaccine immunization has been used but little in this country, because the disease is not dreaded as much as diphtheria and the tendency to develop sickness is more likely to develop in those in whom the toxin or toxoid is injected.

Scarlet fever begins as a toxic and later in severe cases becomes a septic infection. Scarlet fever is due not to a single type of hemolytic streptococci but to several types. This means that a small percentage of the strains may cause infection in children who are immune to the ordinary types. In regard to the permanence of immunity the streptococcus toxin does not produce as prolonged an immunity as does the diphtheria toxin. A series of three injections in which the total amount of Dick skin test fatal doses amounts to 5,000 will give an immunity in about 80% which will last a few months. Five injections in which a total amount of 50,000 to 100,000 skin test doses are given will give in different persons an immunity for one to two years or even longer. The first dose should be about 500 skin test doses. The immunity as shown by a negative Dick test develops in the majority within a few days and does protect against the usual streptococci which cause the infection in scarlet fever. A toxoid has been recently made by adding formalin which reduces the local and general reaction of the toxin by at least 90%. This will probably encourage the more general use of immunization. I believe that a greater effort should be made to lessen the amount of scarlet fever by the use of the toxin or toxoid.

The Value of Injections of Human Whole Blood or Serum from Convalescent or Immune Persons

Human blood or blood serum is frequently used in the prevention of certain of the filterable virus diseases because we have no other preventives. A serious difficulty with the use of human serum is that there is usually no practical way of testing the potency of different bleedings except by success in immunizing human beings. This is true for convalescent sera from cases of measles, German measles, mumps and chickenpox. With anti-poliomyelitis serum we can by the use of monkeys test its potency but this is expensive as it takes several monkeys for testing each single or pooled serum. In the case of whooping cough we have no way of testing the serum except in children.

In judging the effect of human convalescent or adult serum in the prevention of the contagious diseases, one great drawback is that almost no controls have been used to judge whether infection would have occurred if the serum had not been given and also that very few have noted whether children have been retained in the group who have already had the disease and, therefore, are immune. Let us look at the results in sev-

eral diseases in which serum has been most commonly or effectively used.

Measles

We use the convalescent serum either to prevent the development of measles or to do what is usually preferred to allow the disease to develop in a mild form so that all danger is removed. When after injection of the serum in a child no measles develops the partial or complete immunity remains only for a few weeks while in the modified measles immunity develops as markedly as if the child had developed a severe attack. There is no question that the injection of 2½ to 10 cc. of convalescent serum given within four days after exposure will almost surely modify the severity of the disease if it develops or prevent it. In our own experience we have treated more than 1,500 exposed children with only one case dying of measles and this baby already had an empyema which was being drained. We are not sure at what time the convalescent measles serum is at its greatest potency. Probably, however, the period is shortly after convalescence and that after reaching its highest effectiveness, it gradually diminishes in potency. It does not seem worth while to go into details about mumps, chickenpox and German measles because although on the whole convalescent serum seems to have had effect, yet the reports are so very variable that it is hard to be certain.

The Use of Convalescent Serum in the Prevention of Poliomyelitis

The failure to obtain evidence that injections of convalescent human serum or of immune serum from normal adults is of value in the treatment either in human beings or monkeys in whom poliomyelitis has already attacked the central nervous system has added to the intensity of the search for a preventive. The use of antiviral serum for this purpose has been used in several thousand children with somewhat hopeful results. In monkeys, Mr. Schaeffer in my laboratory has proven that the injection of potent horse serum up to either four days before or three days after a nasal infection with virus is a preventive.

Brebner, also of my laboratory, shortly before his death in 1931, injected 1,300 children in Bradford, Pa., at the beginning of an epidemic of poliomyelitis. The immunization took three weeks for its completion. Only one non-paralytic case developed among the 1,300 serum-treated children, while 32 cases developed among the approximately 3,000 untreated children. There is every reason to believe that as in other virus diseases potent antiserum is of real value as a preventive if given at the right time. Probably in the near future a highly potent refined horse antiserum will be available which will produce no more serum reaction than does refined diphtheria antitoxin.

Active Immunization Against Poliomyelitis

Even as far back as the outbreak of poliomyelitis in 1916, endeavors have been made to find a vaccine which would give protection. Dr. Abramson in these laboratories made a very definite advancement. Lately this has been taken up actively by Dr. Brodie in these laboratories and Dr. Kramer in the laboratories of the Long Island Hospital Medical School and Dr. Kolmer in Philadelphia. These vaccines have been prepared in different ways; some by neutralizing the polio virus to a certain extent by polio antiserum; others by lessening the viability of the virus so that it could be given safely and the third by killing the vaccine with formalin. We have not proceeded far enough yet to know what the final results of these vaccines may be but in monkeys and children they have given effective results. The different laboratories which have just been described are vaccinating children by the methods devised by them. The formalized vaccine which we are using has shown definite development of anti-bodies in the children injected. These vaccines are certainly harmless and for the time being are apparently effective. Time alone can tell how long the anti-bodies will remain present in the children and whether they will withstand the danger of direct infection without developing the disease.

The Use of Pertussis Vaccine Against Whooping Cough

For more than 20 years the medical literature has repeatedly had communications concerning the use of whooping cough vaccine. At first, stock cultures on ordinary media supplied the vaccine which was thought by some to be of very considerable value. Others had practically no effect. This result was apt to be true when controls were used. Later it was determined that only bacilli recently isolated should be used for a vaccine. This had considerable vogue for a time.

Recently, Dr. Louis W. Sauer of Illinois reported remarkable results in giving very large injections, the total number for the series of injections necessary for immunity being 90 billion and just last month an article appeared from Dr. Frawley of California who used an

antigen obtained by filtering the dissolved products of the pertussis bacilli.

We have used all types of vaccines suggested by the different writers except the final one by Dr. Frawley. In nearly all cases we have had controls. With a vaccine made by us but given in the amount and made as directed by Dr. Sauer, we vaccinated 45 children in a neighborhood in which whooping cough was developing. Fifteen children were left as controls. Two of the 45 vaccinated children developed whooping cough, while no one of the 15 unvaccinated controls did so. In an institution the Sauer vaccine sent us by Eli Lilly & Co. was injected in 20 children and 21 children were given our vaccine in the same doses. We had 100 as controls. During the past six months no cases of whooping cough have developed either in the vaccinated or unvaccinated. My own belief is that the vaccine from the bacilli of whooping cough does some good but probably not to the same extent as has been claimed.

Immunization Against Tuberculosis

Ever since Koch's futile attempt with tuberculin, the search for a vaccine has been continued and innumerable animal experiments have been made for the purpose of studying the value of injecting them with doses of dead or attenuated living bacilli or their products, with the purpose of producing some degree of resistance. Finally, human inoculations were thought to be justified. The most tested vaccine at present is that of Calmette and Guerin. This, as you know, is made from a bovine bacillus which has been grown for some 20 years on bile potato medium. The French people, under the leadership of Calmette, have used this living attenuated tubercle bacillus vaccine in more than 600,000 infants and believe the lives of many babies have been saved through the resistance to tuberculosis developed by its use orally.

We have used it in New York City for the past seven years in some 600 infants and advise its use in suitable cases. We consider it to be harmless and we believe it gives considerable resistance against infection. In New York, the vaccine is only given to infants living in tuberculous families where exposure is probable. The mortality from tuberculosis is surprisingly small in both the treated and untreated control babies but it is only one-sixth as great in the treated as in the untreated infants.

In Nashville, the vaccine has been given to over 7,000 children without any harmful results. Petroff advises the use of a vaccine made of killed virulent bacilli. We are using this also. Animals show increased resistance but not so much as from the attenuated culture of Calmette. The object of giving the vaccine is to give a first harmless infection instead of a dangerous one. I believe its use should be approved when the infant is born into a tuberculous family and in older children who have a negative Mantoux test.

Indications for Splenectomy in Childhood*

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THE operation of splenectomy has had an increasing vogue in recent years, and the brilliant successes which have followed its use in a certain few of the blood dyscrasias have led to trial of its value in a number of more or less related conditions, in which the results have not always been so gratifying. The question of its possible value in a given case is raised so often that it seems worth while to try to take stock of our present knowledge as to what, from theoretical grounds and practical experience, we may hope to accomplish by it.

While most of the conditions for which the operation has been performed are essentially chronic, and not limited to childhood, this age period is usually the time of their beginning, and of their most striking manifestations, so that their chief interest is really to the pediatrician.

The first, most obvious question to be answered regarding operative removal of an organ of such apparent importance is that of the effect of its absence on the general body economy, and it is surprising to realize how little demonstrable damage has ever been observed to follow splenectomy, either in experimental animals or in humans. A slight degree of anemia, and a moderate, usually transient excess of platelets have been the chief things noted. One reason for this is that the spleen's most important activities, those related to red cell destruction and pigment metabolism, are really only part of the general function of reticulo-endothelium, and while the spleen is the largest depot of this tissue, its function is evidently quickly taken over by depots elsewhere in the body. Some other functions which the spleen is supposed to fulfill, such as regulation of blood production by the marrow, have not been so definitely ascribed to its reticulo-endothelial content, but there is no noticeable disturbance of these functions after splenectomy.

Possible risks in the operation itself are of interest to the subject, as well as to the physician. Splenectomy is a major operation, and often a difficult one. The difficulties are least in conditions such as thrombocytopenic purpura and hemolytic icterus, in which there is little perisplenitis and a few adhesions, and the spleens are not excessively large. Very large spleens, such as are met with in erythroblastic anemia, Gaucher's disease, and sometimes in splenic anemia, offer difficulties because of their size and of numerous adhesions, and the operation is likely to produce a good deal of shock, so that it is not to be undertaken without careful consideration and selection of a favorable time. The operative mortality, however, is small in any series.

Reasons for the removal of the spleen are different in the various classes of disorders in which the operation may be performed. We are not considering here the rare primary tumors of the organ which may call for splenectomy. Speaking generally, these reasons may be grouped under four headings:

(1) To put a stop to a perverted, destructive activity of the spleen which may conveniently be designated hyper-splenism.

(2) To rid the body of the burden of an organ grossly enlarged and rendered useless by disease.

(3) To check the progress of some little understood pathologic changes in the spleno-hepatic circulatory apparatus, and

(4) To remove a lurking place for certain types of infection.

Under some conditions, of course, more than one of these indications may be met by the same operation.

We shall consider the application of these reasons to the various classes of disorders in which the operation has been, or may be of service.

The Constitutional Hemolytic Anemias

The disorders of this group of pediatric importance are: hemolytic icterus, sickle cell anemia, erythroblastic anemia, and erythroblastosis of the newborn.

Hemolytic icterus is the most familiar of these diseases, and the one in which splenectomy has scored its most striking successes. Pathogenesis in this condition is the result of excessive destruction of a type of red cell which is of peculiar construction, and abnormally susceptible to hemolysis by hypotonic solutions. The precise role of the spleen in this destruction is not well understood, and is largely a matter of inference from the effect of the removal of the organ. The destruction is obviously not the common type by fragmentation in the circulation, nor is phagocytosis

*Prepared especially for The Journal-Lancet.

by histiocytic tissues of importance. Without going too far into theory, it may be said that the peculiar red cells must undergo a special form of dissolution while trapped in the mazes of the splenic circulation—an activity of the spleen which we have denominated hyper-splenism, and which cannot be one of the ordinary activities of reticulo-endothelium because it is not taken over by other depots of this tissue after splenectomy. Whether some splenic product plays a part in rendering the cells susceptible to hemolysis is not certain. Some leading authorities believe this, but the usual lack of important change in resistance after splenectomy is an argument against this view. Certainly the chief factor must be the special activity of the spleen in destroying this type of cell.

Results of splenectomy in this disease have been remarkable, both in the "congenital" and the "acquired" types, if indeed there is any real difference between the two. So few failures have been reported that the operation may almost be said to offer a certain cure. Possible causes of failure may be: (1) Operation at an unfavorable time. This is less likely to happen in this condition than in purpura, but is a possibility. Many of the patients come to attention during a hemolytic crisis, which is the least favorable time for removal of the spleen, and if the operation is performed at this time, and the crisis is severe, the result may be disastrous. We have never seen this happen in hemolytic icterus, but we have seen fatalities from operations performed during the crises of hemorrhagic purpura and sickle cell anemia, and reasoning from the somewhat analogous conditions in the several diseases have made it a rule to postpone operation in hemolytic icterus until the blood picture seemed favorable. (2) Post-operative development of accessory splenic tissue. Small supernumerary spleens are common, and should always be looked for, as they enlarge rapidly if left in when the main organ is removed. (3) Complications. We have seen occasional reports of failure of splenectomy in cases in which it seemed to us that a complicating disorder, possibly involving another type of blood destruction, was responsible for the unfavorable outcome. Granting proper diagnosis and careful operation at a suitable time, the results of splenectomy in this disease may be said to be nearly always gratifying. The blood cells do not regain their normal formation and resistance, but the excessive destruction ceases, the cells function well, and the patients continue to all intents normal. This is, moreover, not one of the conditions in which the operation offers difficulties. The spleen is not of enormous size, and adhesions are few, so that severe post-operative shock is seldom encountered. There seems to be little reason for adoption of one of the other methods (ligation of the artery or destruction by X-ray) of putting the spleen out of business. In a considerable series in our clinic we have not yet had a failure from splenectomy in this condition.

Sickle cell anemia is another hemolytic disorder, in which, because of its many resemblances to hemolytic icterus, splenectomy has had a number of trials. While this disease, like hemolytic icterus, is characterized by red cells of peculiar construction, these cells have not the lowered resistance to hemolysis, and the increased destruction seems to be by fragmentation and phagocytosis—activities not peculiar to the spleen. Consequently, cure by splenectomy is not to be expected, and the question is whether under special circumstances there may be enough amelioration of symptoms to make the operation justifiable. Inasmuch as the spleen in this disease undergoes gradual atrophy from blocking of the capillaries, thrombosis and infarction, operation would be helpful only if performed early. In trying to estimate the results of the operation from our own experience and the reports of others, we have concluded that the average degree and progress of the anemia is little affected, but that improvement may be expected in regard to two troublesome symptoms—the hemolytic crises, seldom so severe here as in hemolytic icterus, and the crises of abdominal pain, which are frequently due to splenic thrombosis. We are not certain as to whether any lessening of the joint crises follows splenectomy. While this has seemed to happen in two of our cases, we see no theoretical explanation, and do not yet feel justified in looking on it as more than coincidence.

Splenectomy is more difficult here than in hemolytic icterus, as perisplenitis and adhesions are more troublesome. Justification for the operation is in most cases doubtful, though there does seem to be good reason for it when abdominal crises are frequent and troublesome.

In erythroblastic anemia, while this disease also seems to have a family relationship to hemolytic icterus, definite indications for splenectomy are even less evident. Blood destruction here seems to be almost wholly by fragmentation in the peripheral circulation, and in spite of the great size of the spleen there is little reason to suspect it of any important pathogenetic activity, its share in the disease process being chiefly that of disposal of cell fragments and pigment metabolism. The disease is not characterized by important hemolytic crises, nor by attacks of abdominal pain. As

in sickle cell anemia, splenectomy has been tried in a number of cases, chiefly because of the resemblance of the condition to hemolytic icterus. No one has observed any definite improvement in the anemia following the operation, nor any special change in the disease picture, except the great and permanent increase in normoblasts which seems always to occur. It is, however, a boon to the patient to be relieved of the drag of the large spleen, and we have thought that our patients lived longer after splenectomy than we should have expected without the operation. We are inclined to think that early operation is advisable. We have encountered no serious operative difficulties here, and have had no post-operative fatalities or serious shock.

Erythroblastosis of the newborn is a condition characterized by extreme hemolysis, of a type apparently similar to that operative in hemolytic icterus. It is an acute process, usually rapidly fatal, though in the few cases in which death does not occur within the first days permanent recovery may ensue if the patient can be carried for a week or so by transfusion. We have had experience with splenectomy in one case of this disorder, in which the operation put a stop to the hemolysis definitely and promptly. Unfortunately the patient died ten days later from infection of the wound. The newborn period is not a favorable one for a major operation such as splenectomy, and only the less rapidly progressing cases of this condition would seem to offer opportunity for this form of intervention. We think, however, that its possibility might well be considered in an occasional protracted case like ours, in which we seemed to be making no real headway by repeated transfusion.

The Bleeding Disorders

The only one of these diseases in which splenectomy has been found effective is essential thrombocytopenia—purpura hemorrhagica. Here, as in hemolytic icterus, the pathogenesis seems best explained as due to perverted splenic activity, in this case directed to platelet destruction. This explanation is not wholly adequate, but appears to cover the main facts, especially in view of the return of the platelets after splenectomy.

The results of the operation, in properly selected cases, are nearly as brilliant as are those attained in hemolytic icterus. The selection of the cases is not, however, so simple. One must, first of all, rule out those types of thrombocytopenia in which the difficulty lies in lack of megakaryocyte production rather than in platelet destruction. There is quite a list of these conditions, of which the chief are leukemia and the aplastic states. In addition to these, temporary thrombocytopenia following infection is not infrequently met with. Here there may be only a single purpuric attack, after which the platelets return to normal and there are no recurrences. Splenectomy would be unnecessary in such a condition. Where, on the other hand, the thrombocytopenia is either chronic or recurrent, and the bleeding episodes are at all important, the operation is decidedly to be recommended. Our own practice, when we see the patient in a first attack, is to keep him under observation until we ascertain whether the platelets come back above the danger line. If they do, we advise the parents to bring him in immediately if further bleeding occurs. Often there is no recurrence. In cases with any doubtful features it is wise to determine the megakaryocyte supply by marrow puncture before resorting to operation. Operation is usually fatal in fulminating thrombocytopenic purpura and is not to be recommended in the course of any bleeding episode, the better procedure being to carry the patient through the bleeding period by transfusion, and operate in an interval. The operation itself offers little difficulty. Post-operative transfusion is a wise precaution.

The literature gives one the impression that the platelets, after reaching a safe level and remaining there for a time after the operation, quite often fall again to a point which might make renewed bleeding a possibility, and some recurrences are reported. Judging from our own experience these must be rare. We have had no post-operative recurrence and no important decline in the platelet count in our series. We keep it in mind that here, as in hemolytic icterus, there is a definite possibility of the development of an accessory spleen, and in the case of recurrence in either condition we should be inclined to explore for such an organ.

Splenic Anemia and Splenomegaly With Gastric Hemorrhage

These two syndromes are so much alike that there seems to be little point in treating of them separately. The splenic anemia of childhood is generally looked upon as the first stage of Banti's disease and is usually described as characterized by splenomegaly, moderate amenia and leukopenia, followed after a varying period of months or years by development of varices in the circulation of the upper gastro-intestinal tract with constant or recurrent bleeding, and finally by hepatic cirrhosis. The disease entity is not well defined, and case reports indicate that neither the anemia nor the leukopenia is sufficiently constant to be a reliable diagnostic criterion. Though it is com-

monly stated that the syndrone usually develops gradually in later childhood there are reports of rapidly progressing cases in the early years. The chief difference between splenic anemia and the rare syndrome described as "splenomegaly with gastric hemorrhage" is that in the latter condition the hematemesis is an early symptom.

Statistics, so far as they can be relied upon, seem to indicate that splenectomy puts a stop to the recurrent hematemesis in the second condition, and that in a large proportion of children who are operated upon because of "splenic anemia" the subsequent development of the varices which lead to bleeding does not take place, and the patients are said to be "cured." Unfortunately, the diagnostic criteria are so uncertain that one cannot be sure that in any given case further developments would occur without operative interference; while bleeding, and later cirrhosis, do occur in a good proportion of the patients who have been operated upon. The question seems to resolve itself into that of whether in any case of chronic splenomegaly which cannot be proved to be due to some such cause as syphilis, tuberculosis, undulant fever, Gaucher's disease, etc., it may be wise to remove the spleen in the hope of preventing these untoward late results. In some well-known clinics splenectomy under such circumstances is the rule. Fortunately the ordinary practitioner seldom has to make the decision. Our own experience has been disappointing, but we are not prepared to say that the argument for the operation is not sound.

Chronic Leukemia and Gaucher's Disease

These two disorders are mentioned together because the only argument for splenectomy in either of them is that of ridding the patient of the burden of the enormous spleen. There is no hope of a curative effect in either. There is a good deal of information as to splenectomy in chronic myelogenous leukemia, with quite unfavorable conclusions, which is natural if any important effect on the disease process was hoped for. It seems to us, however, that there is a good argument for the removal of the organ before it becomes too large for safe operation, and when the patient has been put in the best possible condition by X-ray or radium treatments. Gaucher's disease is rare, and there is no information as to possible symptomatic relief from early splenectomy, but we think that in a suitable case the operation might well be considered.

Chronic Infections

There are some chronic infections in which the mazes of the enlarged spleen seem to furnish a lurking place for the infecting organism, which occasionally emerges to cause recurrence of symptoms. Examples of this are malaria, syphilis and undulant fever. It is not common practice to perform splenectomy because of such a state, and usually the infection can be held in check by less drastic means. There is an occasional obstinate case, however, in which the constant, perhaps progressive splenic enlargement, and persistent recurrences render it probable that the spleen is the source of supply, and in which it would be logical to make trial of its removal. It is a procedure to keep in mind for the rare case.

The question sometimes arises of the advisability of removing the large fibrous spleen which occasionally develops in the course of chronic pyogenic infection. This type of splenomegaly is sometimes followed by the same sequels that we meet in the Banti syndrome, and as the spleen is largely destroyed from a functional viewpoint, and a potential source of further trouble, it is probably well to remove it. In our one experience with a case of this kind, though the splenomegaly had not been of long duration, vascular dilatation, intestinal bleeding and cirrhosis developed in rapid sequence in spite of the operation, which had been performed, not with the idea of forestalling them, but because of local disturbances due to adhesions between spleen and omentum.

This brief discussion has taken no account of other procedures designed to replace splenectomy as a means of putting a stop to the pernicious activities of the spleen. Two of these, destructive radiation and ligation of the splenic artery, have had some vogue, and both seem to be capable of achieving results in the two most important diseases, hemolytic icterus and purpura. Treatment with the ray is slow and not very certain, and to our mind has little to recommend it except in cases where there is some contraindication to operation or in mild cases in which the patient's family is opposed to operative procedures. Ligation of the artery has been successful, and might well be resorted to when conditions encountered at the time of operation (shock or troublesome adhesions) interfered with complete removal.

The Indications for Tonsillectomy in Children Based Upon the Relationship of the Tonsils to Infections*

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THE tonsils and adenoids receive more attention in children than any other organ. This interest has resulted in the removal of the tonsils and adenoids in a great many children at various ages. In many of our American cities from 40 to 60 per cent of the children at twelve years of age have had their tonsils and adenoids removed. It has been generally accepted for some years that infected tonsils not only could be responsible for certain local infections such as tonsillitis, peritonsillar abscess and cervical adenitis but also for certain systemic diseases such as nephritis, and rheumatic disease.

Assured of this relationship in selected cases and influenced by the beneficial effects noted frequently after the removal of the tonsils and adenoids the operative procedure became popularized with the laity and with many physicians so that it was performed on the slightest indication. In fact, tonsillectomy was often performed before the child was properly examined. Consequently the distinction between so-called normal tonsils and diseased tonsils was not made. This enthusiasm resulted in the removal of healthy tonsils as well as in the removal of diseased tonsils. For a short period there arose advocates for universal tonsillectomy.

If the function of the tonsils was better understood or if there was some unanimity of opinion among those who have discussed the function of the tonsils there might be a definite reason for removing certain tonsils and leaving others alone. Definite functions have been assigned to the tonsils but the evidence both clinical and pathological does not always support these theories. The most plausible theory assigning to the tonsil the role of defensive mechanism has not been entirely supported by clinicians who report that even when the tonsils are removed early in life the child appears to combat infections. However clinicians are becoming more and more mindful of the fact that the tonsil plays some part in the defensive mechanism of the individual and especially in the young child. Just how this defense mechanism works and why it fails to work is not clearly understood.

*Prepared especially for THE JOURNAL-LANCET.

In the present state of our knowledge on the function of the tonsils it is safe to assume that there is some evidence to support the theory that a healthy tonsil helps to confer immunity by protection against bacterial invasion. It has been shown that the lymphocytes in the tonsils are continually migrating through the epithelium, phagocyting the bacteria into the crypts and returning into the lymph-nodules where the bacteria are destroyed and some measure of immunity attained. This protection as a first line of defense is a function of the healthy tonsil only and during the earlier years of life. It is suggested that their associated cervical glands act as the second line of defense. Clinical experience seems to support this contention that in a young child under six years of age the healthy tonsil has a protective function. Our own statistical observations showed that the routine removal of tonsils, known to have produced no clinical symptoms prior to the operation, tended to make these children more susceptible to acute infections.

Even if one accepts the theory that the lymphatic tissue in the nasopharynx contributes to what we term the development or maintenance of immunity, the mechanism involved is not understood. In spite of this vague and unconvincing evidence regarding the physiology of the tonsils there are very positive reasons for the surgical removal of tonsils. Experience and controlled studies of children over a long period of years have shown that the presence of tonsils causing mechanical obstruction and the presence of definitely diseased tonsils are adequate reasons for their enucleation. The problem that confronts the clinician is to know when tonsils are diseased. To be sure a careful inspection of the nasopharynx aids in this decision but it is impossible always to rely alone upon the result of such an examination.

The response of the child to various common infections with the tonsils in and after the tonsils have been removed gives some idea as to the part the tonsils play in the causation or control of these infections. Such information must be obtained from a critical study of properly controlled children over a long period of time. From such an analysis it is possible to predict with some degree

of accuracy the likelihood of the relationship of the tonsils to certain infections in childhood.

Invariably any interference with normal deglutition and breathing especially in the supine position handicaps the development of the child. As a rule examination of the nasopharynx determines this impediment but at times improper decisions are made following examination of the throat unless the complaints reported by the parents are given due consideration. Not all large or hypertrophied tonsils are causing mechanical obstruction. Hypertrophied tonsils may be causing a child not the slightest discomfort or in any way retard the child's development. On the other hand marked hyperplasia of the tonsils need not be evident to account for an obstructive factor. Due evaluation must be given to the subjective complaints and that data added to the results of the physical examination forms a reasonable criteria for tonsillectomy or decision against such a procedure.

The pathological changes described on a section of a removed tonsil cannot, of course, be recognized before the tonsils are out. There are, however, certain abnormal conditions that can be recognized by the clinician which will aid in making the decision of a normal or a diseased tonsil. They are: (1) The escape of pus from the crypts when pressure is applied to the tonsil. (2) An enlarged tonsillar gland behind the angle of the jaw, varying in size and sometimes tender. (3) A purplish red tinge limited to the anterior faucial pillar. (4) Abnormal preponderance of leukocytes in material from the tonsillar crypts, frequently accompanied by general hyperemia of the pharyngeal and palatal mucosa. Cultural studies of the tonsil are helpful in making the diagnosis of a diseased tonsil where specific infections are suspected. This is particularly true where the diphtheria bacillus, tubercle bacillus and certain fungi are isolated from the tonsil. The common bacterial invaders of the throat usually found on surface cultures or even from the crypts of the tonsil do not necessarily indicate a clinical infection from such organisms. A single or a recurrent attack of certain infections either directly or indirectly associated with the nasopharynx are usually the cause for an operation on the tonsils and adenoids. The infections that are associated with the tonsils and adenoids are those termed upper respiratory infections, such as tonsillitis, head colds, otitis media, sinusitis and cervical adenitis and lower respiratory infections such as laryngitis, bronchitis, pneumonia and tuberculosis. A number of general infections such as scarlet fever, diphtheria and measles are also associated with the tonsils. The systemic diseases including acute arthritis, chorea, rheumatic heart disease and nephritis must also be considered as secondary infections to some focus of infection such as the tonsil.

The incidence of these various infections has been noted in a large number of children before tonsillectomy was performed and after the tonsils have been removed. Observations were also made on a similar group of children whose tonsils were not removed. The two groups were observed for a period of ten years and comparative studies were made. It was noted that certain infections were more common during certain age periods and cognizance of this fact was taken in evaluating the results of the study.

A cold in the head is the most common infection in young children. Removal of the tonsils and adenoids for this infection was somewhat disappointing. Only 12 per cent more children in the tonsillectomized group showed a lessened incidence of colds as compared to the control group. The greatest benefit in the escape of colds for the operated children was noted in the early years of childhood. It would seem that the removal of the adenoids was largely responsible for this improvement. Obviously the removal of the tonsils and adenoids offers no sure protection against colds in the head.

Attacks of tonsillitis and sore throat occur in about 40 per cent of all young children in this climate. The relationship of the tonsils to this type of infection is quite clear. Tonsillectomy definitely benefited these children for at the end of 10 years only 10 per cent were still subject to sore throats while among the unoperated children 35 per cent were still having repeated attacks of tonsillitis.

Cervical adenitis is a common infection in childhood. In this community it was found that 15 per cent of the children had definite enlargement of the cervical glands during their early years of childhood. In some children this evidence of infection was acute, while in others the enlargement lasted for weeks or months. Surveying the same children at the end of the ten-year period it was found that cervical adenitis, either acute or chronic, was existent in seven per cent of the tonsillectomized group and in 14 per cent of the children whose tonsils were not removed. Removal of the tonsils does not prevent the occurrence of cervical adenitis though it does definitely influence its frequency.

Purulent otitis media occurred in from 12 to 15 per cent of children below the age of six years. Fifteen per cent of the children in the group in

which operations were performed had trouble with the ears, while in the control group 12 per cent had been subject to infections of the ears. At the end of the ten-year period five per cent of the children operated on were still having attacks of otitis media, while among the control children six per cent were having the same disturbance. Remembering that there were more children in the group in which operations were performed who had been subject to infections of the ear, one can note a reduction of 10 per cent in that group and a reduction of six per cent in the control group. Below five years of age first attacks of otitis media occur twice as often in children whose tonsils and adenoids have not been removed. After five years of age first attacks of otitis media occurred as frequently in tonsillectomized children as in those who had not been tonsillectomized. However, recurrent attacks of otitis media were less likely to occur. Since removal of the tonsils and adenoids has a favorable influence on the incidence of otitis media in the early years of life, it seems probable that the removal of the adenoids is of greatest benefit for it is at this period of childhood that adenoid tissue causes the greatest obstruction to breathing.

The tonsils and adenoids have some relationship to the common infectious diseases in childhood. No relationship could be found between the tonsils and chickenpox, mumps and whooping cough. Measles occurred with equal frequency in tonsillectomized children and in those who had not undergone this operation. Diphtheria occurred in about one-third fewer children whose tonsils were removed while scarlet fever was almost as likely to develop in tonsillectomized children. In the cases of scarlet fever studied in the hospital, it was found that more complications developed in children whose tonsils had not been removed. The tonsils, therefore, have an influence on the infections of diphtheria, and scarlet fever. Their removal offers a reasonable protection against these infections and some chance of escaping complications if the disease does develop.

The effect of the tonsils and adenoids on the lower respiratory infections has been studied in acute laryngitis, bronchitis, pneumonia and tuberculosis. From a statistical study of these infections it would seem that the presence of the tonsils safeguards the child against these lower respiratory infections for the tonsillectomized group showed a higher incidence of bronchitis and pneumonia. Pulmonary tuberculosis seemed in no way influenced by the presence or absence of tonsils though tuberculous adenitis was found to be secondary to a tonsillar infection in a high percentage of the cases.

The tonsils hold a prominent place among the factors that may influence rheumatic infection in childhood. Some years ago it was assumed that infection in the tonsils was largely responsible for the subsequent manifestations of rheumatism. More recently several observers have shown that the removal of the tonsils following the initial attack of rheumatic fever or chorea did not safeguard the child against recurrences any more than when the tonsils were not removed. These divergent views have left considerable uncertainty in the minds of the physicians as to what course to take in the treatment of the tonsils in a rheumatic child. Several studies on a large number of school children as well as a detailed survey of 1,200 rheumatic children shows that the first attack of rheumatic disease is less likely to develop in a tonsillectomized child. This advantage for the tonsillectomized child varies from 10 to 30 per cent depending upon the age of the child. The rheumatic infections that do develop are likely to be less serious in the tonsillectomized child. It was found that the mortality rate was nearly twice as high among the rheumatic children whose tonsils were still in. Recurrent attacks of rheumatism occurred as frequently in tonsillectomized children as in the untreated ones, at all ages. When the tonsils were removed after the initial attack the percentage of recurrences were only slightly less than when the tonsils were not removed. It appears that rheumatic fever and rheumatic carditis are less likely to occur in the tonsillectomized children while chorea and muscular rheumatism are slightly more prevalent in the tonsillectomized children. Inasmuch as the mortality exists chiefly in the first group, there seems to be some advantage to the child to have the tonsils out in combating this disease. Acute sinusitis is being diagnosed more frequently in children. Whether it actually occurs more commonly or is now more frequently recognized as an entity is not certain. It certainly is found frequently in children whose tonsils and adenoids have been removed. On the other hand, diseased tonsils may often be the cause of a sinusitis.

Dental infections are definitely influenced by the presence or absence of tonsils. Dental infections may occur in any children but it was found that they occurred twice as often in children with tonsils in than among those with the tonsils removed.

Other less common infections such as pyelitis and nephritis may follow an attack of tonsillitis. There is statistical and clinical evidence to show

that there is a relationship between the tonsils and this type of infection.

The desired relationship between the tonsils and the various infections in childhood is not as clear today as it seemed to be 10 years ago. Statistical and controlled clinical studies have obliged us to modify or even change our views on this relationship. Not so many infections can be prevented or modified by the removal of the tonsils as was prophesied in the early days of enthusiasm for the treatment of diseased tonsils.

One can construct certain indications for the treatment of the tonsils and anticipate the degree of benefit following the removal of the tonsils. The individual case must be studied and the statistical data obtained from the study of large groups must serve to influence the physician in the decision on the individual case. The following results can be reasonably expected from tonsillectomy based upon the type of complaint noted at the time the decision for operation is made.

Beneficial Effect in 30 to 50 Per Cent of the Children.

1. Frequent attacks of tonsillitis.
2. Recurrent attacks or chronic cervical adenitis.
3. Tuberculous adenitis without pulmonary tuberculosis.
4. Otitis media—adenoids only in young children.
5. Rheumatic infection other than chorea.
6. Diphtheria carrier—reduces incidence of diphtheria.
7. Scarlet fever—slight reduction of incidence and complications.
8. Nephritis—after acute attack reduces recurrences.
9. Dental infections—less common where infected tonsils are removed.
10. Cyclic vomiting especially if associated with fever.

Beneficial Effect in Less Than 25 Per Cent of the Children.

1. Head colds. Most helpful to children five to eight years.
2. Chorea. To reduce incidence of cardiac involvement.
3. Laryngitis. Frequently occurs for first time after tonsillectomy.
4. Malnutrition.
5. Sinusitis.

No Beneficial Effect Can Be Anticipated Except in a Small Per Cent of the Cases.

1. Bronchitis.
2. Asthma.
3. Pneumonia.

In a general way one can prognosticate the results following tonsillectomy if the indications for the operation are definite. It must be remembered, however, that vague complaints that do not conform to the usual classification of infections may be due to infection in the tonsils. One is justified in recommending tonsillectomy in these children if all of the other possible causes for the vague complaints have been eliminated. Not infrequently the child is benefited in such instances. An exhaustive history supplementing the physical examination is essential in the diagnosis of each child.

Is Human Milk Best For Babies?*

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A FEW years ago there was no question but that everybody would have said that it was pure nonsense to pose such a question. Of course, human milk was best for human babies. There was no question about it. Is there still a question? We have learned that many of the things which we regarded as known facts in the past have been dropped from that category when searching scientific effort was directed against them. Is that true of breast nursing? In other words, has there been perfected a way of feeding babies which is better or at least as good as the way that nature apparently intended them to be fed? Has our knowledge of dietetics and foods, chemistry and biology reached the point where we have a way that we can supply a perfect food for a baby from some material other than breast milk? What are the criteria by which we may estimate the relative values?

In these times the first question to be asked is which is cheaper for the mother, to nurse the child or to feed it on the bottle? Second, which is easier, for a mother to nurse her child, or to prepare food for it? Third, is the nutrition of the child as judged by physical standards better if the child be breast fed, or if it be artificially fed? Fourth, is the general health of the child protected better if it be breast fed or if it be artificially fed? There may be other criteria, but certainly these are the most important ones.

There can be, I think, very little question but that it is cheaper to nurse the baby than to prepare an artificial food no matter how simple and how cheap that artificial food may be. The mother will not require appreciably more food when nursing the baby than when she is not. There certainly is an economic factor involved in the fact that in the poorer walks of life mothers do nurse their babies more than in the more prosperous sections of society.

Is it easier? This depends a great deal upon whether the mother prepares the food herself, or has someone to do it for her. It certainly is easier for a mother who cares for her own baby, to have it take already prepared food than it is to prepare that food and to give it to the child. Nor if properly regulated does it limit necessarily the mother's social activities. In the majority of instances, therefore, it is probably easier for a mother to nurse her baby than to feed it artificially unless she can employ somebody to prepare the food and give it to the baby—in other words, have a nurse.

Is the child as well-nourished on artificial food as on breast milk? With our present knowledge of diet and hygiene of infancy, the artificially fed baby except in the early weeks of life, will compare very favorably from the nutritional standpoint with the breast fed baby. It is very hard to say absolutely as to just whether the physical results are as good in one as in the other because our original standards were unquestionably founded on the healthy breast fed baby, but taken by and large after the first three months of life, the nutrition of the child under proper conditions and proper modern education can attain and be kept at about the same level as that of the breast fed infant. It requires careful attention to details and a very carefully regulated diet in many instances, but the fact still remains that these children from a nutritional standpoint are practically on a par with breast fed infants. We see, therefore, that in answer to three of the four criteria, the balance leans to the side of breast feeding. Now as to health. Nutritional disturbances due to deficiencies in the food, once so prevalent in artificially fed infants, have been largely eliminated, so that these no longer enter to any degree into the situation. For the purpose of studying this situation, therefore, we must turn to the question of infections and allied conditions in the two groups of infants.

The records of 20,061 babies who were under the care of the Infant Welfare Society for as long as nine months, during the years 1924-1929, were classified and reviewed. Breast feeding was promoted as much as possible. Artificial feeding was of a simple sort that was well fortified with cod liver oil and antiscorbutics. The details of this may be found in the original publication.[1] Of these 20,061 babies, 9,749, or 48½ per cent, were breast fed entirely except that cereals and vegetables were added at respectively five months and six months. Eight thousand, six hundred five, or 43 per cent, were partially breast fed and 1,707,

*Prepared especially for THE JOURNAL-LANCET.

1. Journal Amer. Med. Assn., 1934 (Sept. 8), Vol. 103, p. 735-8.

or 8½ per cent, were artificially fed. I shall not go into the details of the statistics, but without exception the breast fed babies showed fewer infections than did the artificially fed, whether these infections were respiratory or others. The incidence of infection for instance in the breast fed babies was 28 per cent and in the artificially fed 39 per cent; while that of the partially breast fed was 34 per cent. Of the gastro-intestinal affections breast fed 5.2 per cent, artificially fed 16 per cent and here again partially breast fed were in between, 12.8 per cent. Of unclassified affections breast fed showed 3.3 per cent, artificially fed 8.2 per cent and partially breast fed 6 per cent. The difference here is not so great, but it is significant and probably points to the fact that an artificially fed baby under the same conditions has an increased incidence of infection over the breast fed.

How about the severity of these infections? This can probably best be determined by a consideration of the death rate. The total number of deaths in these 20,061 babies was 218, or 11 per thousand. This is about one-fourth the death rate among the babies of the same class and region in Chicago, so that the death rate as a whole was quite low, but of these deaths 144, or 66.1 per cent occurred in the artificially fed babies, while only 15 or 6.7 per cent occurred in the breast fed babies and 59 or 27.2 per cent in partially breast fed. In other words, nearly two-thirds of the deaths occurred in one-twelfth of the babies. While the death rate among breast fed babies was one in 650, in the artificially fed the rate was one in approximately 12. Sixty per cent of these deaths occurred as the result of respiratory conditions. Of a total of 130 deaths due to respiratory conditions only 4 were in the breast fed infants and 82 in the artificially fed. These figures, it seems to me, are sufficient to show that not only are artificially fed infants much more susceptible to infections than are breast fed infants, but also that they are immeasurably less resistent to such infections.

It should be remembered that these cases were taken from the poorest districts in Chicago and it may, therefore, be argued that they are of no significance for private practice. On the other hand, allow me to call your attention to the fact that the death rate among these children was only 11 per thousand, a death rate which is extremely low for any group of infants under a year of age. Whether we can use these for estimating the value of breast feeding in private practice or not, it seems to me that such figures are quite convincing as to the protection which breast feeding gives against infection. It also seems to me that such figures justify us in using every effort we can to keep all the babies we can on the breast.

There is a definite impression among both the laymen and physicians that the number of babies nursed at the breast has been rapidly diminshing. This seems to be especially true in the more prosperous walks of life. This has been attributed to many causes, but principally, I think, to the tempo of modern existence. Whether this be true or not, it seems to me that one great factor has been overlooked. During the last ten or fifteen years, there has been an increasing tendency for obstetricians to send the mother to a hospital for delivery. No one will question that the first two weeks of life are the most important in determining whether or not a child shall be breast fed. Is there any reason why so many babies leave our hospitals on the bottle? An adequate, but suggestive survey of two comparative groups has led me to think that the new-born infant in the home is much more likely to be breast fed than the one in the hospital and as a consequence, I have tried to determine what conditions there could be in the hospital which would lead to this result. Certainly the mother is more comfortable and much more free from care than she would be in her own home, so that the physical conditions are ideal for promoting breast feeding. She is on a good nutritious diet. Under present conditions pathologic labor is not a seroius factor since the vast majority of women delivered in hospitals, are delivered normally. What about the psychological situation? For the mother it is ideal with these exceptions. In the first place, she is associated with a number of other women who very likely have the idea that it is not necessary to nurse their babies. It is very easy for her to become obsessed with this notion and therefore, she does not make the effort that she would otherwise, but this is probably a minor factor. In most instances, the baby's feeding is left largely in the care of the nurse and if this is not so the suggestions and observations of the nurse must have their effect upon the physician. On the nurse then rests a heavy responsibility. Most of the nurses that I have seen have been all too prone to give a child a bottle on the slightest provocation; if the child cries, if it looses weight, or if the number of stools is reduced, immediately the child is given the bottle in order to correct these conditions. Again there is what seems to me to be the pernicious doctrine that if it is perfectly proper to

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The Practical Consideration of Diets for Normal Children During First Two Years of Life*

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WHILE a subject matter such as this cannot introduce many new ideas to the average physician and will therefore be rather uninteresting, it is nevertheless worth while occasionally to brief some fundamental ideas connected with infant feeding.

There is no object in diagraming an exemplary diet regime from birth to two years of age, in that our competitor, the "Robot Doctor," dispenses this knowledge to us and the public—to us unrequested, and to the public, who accept it verbatim. The "Robot" is a product of our own creation which has grown to such monstrous size that to tear him down will be far more difficult than his creation. He is a composite of lay magazines, Government Bulletins, patent baby food pamphlets and the verbal barrage of visiting nurses organizations. His seems to be a firm attempt to remove the necessity of meeting the personal requirements of the individual child and mould him into one standard type in the various stages of his development. True, we have and undoubtedly always will find it necessary to have standard diets for various ages of babyhood, but should they not be dispensed by the physician to the *average* child and not to all regardless of temperament and requirements?

The baby soon after birth should logically have an ample supply of breast milk. Statistics show clearly the value of the mother's milk to the infant, especially through the first three months of life. Standardization of infant care has done much to dispense with and ruin this supply. In our newer knowledge of simplified feeding we have been too anxious to prevent the initial loss in weight before the breast milk has been stimulated into a sufficient supply. Starting the complementary feeding early gives such a ready supply of nourishment to the infant that he fails to show the necessary interest in the breast. Oftentimes a sufficient supply is not established or maintained until after the mother has been discharged from the hospital and has again assumed the responsibility of her household. We are likely to err in not warning the mother of the likely drop in breast milk during those first few days and, while a complementary feeding started then will quiet the household, it very frequently prevents the re-establishment of breast milk. The more recent attitude of the physician in encouraging the mother to nurse her baby has done much the past three or four years to convince her of the privilege and necessity of maintaining breast milk. But the propaganda for formulas, complementary and supplementary, goes merrily on.

Perhaps it is not amiss to remind one of the poor results obtained in hurriedly changing the baby from the breast to various formulas for the so-called "colic." Our highstrung, temperamental babies of the present day are very prone to so-called "colic," but usually one will find that it is not the milk but the baby. Not so many years ago a chemical analysis of the milk was stressed as the final word in determining whether the supply was filling the requirements through a consideration of the percentages of fats, carbohydrates and proteins. Now we know that even the thinnest, bluest breast milk imaginable may meet all the requirements of the individual baby concerned. Two further factors must be considered before substituting for a plentiful breast milk supply; first, have the parents spoiled the baby through over-attention and now prefer to call it "colic," or secondly, is some antispasmodic to remove the reactive nature of the baby necessary before any form of milk will take care of the situation?

We are very fortunate to be practicing medicine in this day of simplified infant feeding. It is no longer considered plausible to regulate the child's diet by the stool inspection for the average feeding case. Again, the method of figuring the infant's weight requiring so many calories and at such an age so many ounces at a feeding has very few advocates today. Our main interest is to meet the demands for proper growth and satisfaction to the individual baby concerned. There are a few sturdy infants who require whole undiluted cow's milk from birth; there are others who need the strength of whole milk in their formula to maintain an average gain in weight, but must have a smaller curd for proper digestion and comfort. This can be provided as evaporated milk,

*Prepared especially for THE JOURNAL-LANCET.

powdered milk or lactic acid milk; others do not tolerate such a high caloric concentrated feeding and gain well on a much greater dilution.

The carbohydrates in the form of sugar that should be added to a given formula should not be standardized. The teaching of some of our well-known pediatricians has been the use of a high sugar content in the formula. This teaching in the hands of experienced physicians can do no harm, but the knowledge dispensed far and wide by the "Robot" has done much to produce fat, rolly-polly babies commonly seen in condensed milk ads. The babies are subject to long stationery weight periods, usually commencing about the eighth month of age and there is no question but that eczema is more prevalent among babies receiving this unnecessary amount of sugars. The amount of carbohydrate added to the formula should be sufficient to produce satisfactory bowel movements and aid in the average gain of the infant. Choice of the sugar used is again a matter of the requirement. Knowing the properties of the various combinations aids materially in the selection.

The physician in charge of the case can best determine the time to begin the use of orange juice and cod liver oil in the baby's diet. In that there is a service period of six weeks to all newborns in the group with which I am connected, we have made it a practice to start these substances at the time of discharge. A percentage of infants cannot take orange juice well, either diluted or undiluted, sweetened or unsweetened. Tomato juice is the usual substitute but even this may not be tolerated. Scurvy is rarely seen in this territory, even under the most unfavorable circumstances. The necessity of disguising cod liver oil, or forcing it on infants has become unnecessary because of the substitutes, viosterol or haliver oil, or the combination. There are a number of infants, however, who cannot tolerate even these substances in the customary drop dosages. Rickets is very common, at least to a mild degree, in this climate, even though the theoretical upper limit in dietary antirachitic measures are used. Permanent deformities, however, are rare.

Usually at four months of age, it is customary to begin solids. Cooked cereals are introduced often in the form of a gruel and gradually thickened as the infant is able to use it. In the breast fed infant with a fair supply, or a bottle fed baby, still manifesting hunger, cereal may be begun at any time. Earlier than four months it is probably best to inculcate it in a formula. It is of particular value early in cases of obstipation where we need more stool bulk to induce regular movements, or in case the breast milk is too laxative and non-sustaining over the three or four-hour interval usually allowed between feedings. With a good breast milk supply and a sturdy well satisfied infant, the cereals may be postponed until six months of age if desired.

Green vegetables are introduced usually at the sixth month of age but in case of anemia, or where there is a stubborn constipation the sieved forms may be given earlier. At approximately the tenth month of age it is advisable to mash the vegetables with a fork instead of sieving. This is begun as early as possible to prevent the complaint which is so commonly heard when sieving is kept up too long, "I just can't make my child take anything but liquids." Thanks to the more recent studies in food analysis we now know that it is unnecessary to force any infant to eat spinach and we might add, or peas or string beans or any other one form of vegetable which he may thoroughly dislike. Of course, there are foods the infant will not care for and the physician can prevent any strained relationship between mother and child if he will assure the mother of the fact just mentioned. So often she will say that her child seems to like raw carrots but she had scarcely dared add them to his diet. Is there any reason why he should not have also raw finely chopped cabbage or lettuce, as well as carrots? And let me suggest that seasoning of the infant's food in moderation can do no harm. Certainly a pinch of salt added to the sieved vegetables previous to warming or cooking makes them far more palatable even to the infant.

We are frequently questioned concerning the necessity of eggs in the diet. The "Robot" physician emphasizes their use, oftentimes as part of the formula. Eggs should be introduced cautiously in any infant's diet and particularly if there is a family history of allergy. One or two drops given over a few days will determine the infant's sensitivity in the average case. Beef juice is used frequently in the infant's diet after six months of age to aid in relieving the tendency to our seasonal anemias and to add a desirable flavor to vegetables. Potato is digested poorly by a considerable percentage of infants under one year of age.

The introduction of fruit into the diet should be largely up to the physician. Apples as sauce or scraped, prunes as juices or pulp, bananas—ripe, mashed or baked—may be added to the diet as early as four months of age.

At this point it is advisable to mention the fact that there should be no desire to stimulate the infant to an early demand for variety. One new

food should be introduced at a time and it is a good rule never to urge a child to eat when tired or irritable. An old method for keeping some food in the diet which an infant thoroughly dislikes is the "goulash." This may be made by mixing the cereal, vegetable and fruit together, or beef juice, vegetable including potato and possibly some finely chopped meat. Frequently you will find when meat is first introduced in the diet that it is chewed, and chewed and chewed by the hour and eventually spit out. Assure the parents that this practice is only temporary and not to become discouraged as so many of them are likely to do.

The four-hour feeding is the usual one for the infant under six to eight months of age. The 2 A. M. feeding is not popular with the average mother or physician, but does much in the first weeks of the infant's existence to aid in establishing the milk. In the breast fed infant three-hour intervals may be necessary instead of the four. After eight months of age three feedings a day are usually sufficient. I recall one interesting case of an infant who nursed only twice daily between the ages of six weeks and eight months of age and was well above the average in weight and stature. This case is introduced merely to show how necessary the attention of the physician is even in what appears to be an average case.

There is no need of mentioning further the dietary regime of the average child, but merely to emphasize that if the diet sheets are used, it is advisable to remark to the mother that other foods than those included on the diet sheets may do equally well. In other words, do not have them leave the office with the feeling that you have prescribed medicine instead of food.

If all physicians were asked to quote the most common complaint of the average mother concerning her child, I believe this would be the sentence: "Doctor, my child just won't eat," or "My child has no appetite." I firmly believed for some time that a logical reply should be, "Just put the food in front of your child and if he does not eat, put him down from the table at the conclusion of the meal and repeat this until he does eat." Theoretically, this reply was perfect; practically, it fails to solve the problem in a large number of cases. We have developed a race of finicky, high-strung, temperamental children. True, statistics show where infant mortality is definitely on the decrease. The medical profession rightly deserves the credit. However, there is much for which we should take the blame in creating this new type of child. Have we not failed in allowing the "Robot" to take over the instruction of the parents? We did harm in attempting to mould every child according to a set schedule, particularly in diet. For the past years we have recognized that error and in a small way are attempting to broaden the attitude of the public. But the personal care of a physician is necessary to remove the harm done. If we will use our power and common sense to dispose of the "Robot," sentences such as "I simply made Johnny eat his spinach—or else!" and "Mary simply refused her cooked cereal, but believe me I made her eat it" will be for the most part a thing of the past. We realize that other factors have entered in, such as the latent hyperthyroid activity but certainly the average present-day attitude towards infant feeding has done little to benefit this condition. Will it not be to our advantage to find out what nourishment the child craves, what agrees with him; and with our advice and encouragement much can be done to relieve the mother of the feeding worries created during the first two years of life resulting in permanently established complexes in the child.

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feed a child at this stage in order to prevent initial loss of weight. A child who is satisfied with artificial food never makes the effort to nurse that he would if hungry and therefore, the mother's breasts do not receive that essential stimulation which is most necessary at this time. The result of all these factors is that the mother is not able to nurse her baby. In other words, by the laity, by the nurses and by the medical profession, the question of breast feeding has been regarded all too lightly and many children are robbed of a protection to which they have a right, because of false notions in these three groups.

We have all seen a great proportion of children who are subjects of loss of appetite because of too great stress laid upon details of diet. Is the great benefit which came to women as the result of hospitalization during delivery, to be off-set by the dangers from taking the child off the breast?

Infection and the General Service Hospital*

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WE HAVE now reached the stage in the control of communicable diseases where we may justly boast of a low incidence among the general population. There are weeks when the health department of a large city does not have a single reported case of diphtheria on its records, and in many communities long periods of time pass without the development of any case of contagious disease. The situation prevailing in the community at large, however, does not exist to the same favorable degree in many of our hospitals.

General service hospitals are used largely for the treatment of sick people and many of the patients admitted to them are suffering from communicable diseases, either recognized or unrecognized. In some instances it is the symptoms of such a disease which bring patients to the hospital; in the majority, however, it is some noninfectious medical or surgical condition which is the cause of their admission. Symptoms of communicable disease in patients may often be minor or entirely absent. The entry to hospitals of patients with unsuspected contagious conditions and of carriers of virulent organisms which cause diphtheria, typhoid fever, tuberculosis, scarlet fever and other diseases is far more common than most people suspect. The general service hospital, therefore, becomes a congregating place for many persons suffering from known as well as unknown forms of communicable disease. The problem arises then of preventing exposure of patients to certain conditions other than those for which they were admitted. In addition to the need for protecting patients from contamination it is our additional duty to protect personnel, visitors, and others with whom patients may come in contact. The initial step in preventing institutional spread of contagion requires that careful admission diagnoses be made and here we are indeed fortunate in having arrived at a time when even the carrier of diphtheria, typhoid fever, tuberculosis and other diseases can be detected with remarkable accuracy through biological tests, microscopic, X-ray and physical examination. Once a diagnosis is made, we are again fortunate in knowing how to prevent the spread of these diseases to the patient's associates. Although the medical and nursing staffs of general service hospitals have such information readily available, nevertheless, it is frequently neglected by those in authority. As a result many hospitals become focal points of infection in a community. Instead of being places to terminate infection, many have become disseminators of communicable disease by allowing patients to transmit diseases to other patients and to personnel, who in turn carry them back to the community. In the days when such diseases ran rampant among the population, there was little opportunity to become informed of the real situation in our general hospitals but now, through public health regulations and epidemiological studies, it is often possible to trace the disease in one person back to its source. Unfortunately, a great many institutions which should be models in health control and centers from which the very best health control information emanates are the most vicious offenders in the community. This may easily begin to reflect upon the nursing and medical professions of our country. On the obstetrical services of some hospitals the incidence of puerperal sepsis is even higher than in homes. In the discussion on this subject, DeLee says: "It must be realized that the human being is the most common ultimate source of infection and that since numbers of diseased persons are gathered together in one place in the general hospital, this is a veritable cess-pool of infection." Most certainly if the public becomes informed of the facts as they now exist in some institutions the hospital will be a far less popular place to treat the sick than it has been during the past. It seems incredible, however, that the medical and nursing professions, who support the hospitals of this country, will permit administrators to continue to ignore the importance of this subject. It is more likely that when their attention is called to these conditions, they will organize their staffs so as to bring about a complete change entailing the adoption of more rigid technique. Already a number of hospitals have done this. Many of us have witnessed the spread of the common cold,

*Prepared especially for The Journal-Lancet.

of wound infections, and of similar non-reportable diseases in our institutions, records of which are entirely inadequate and often inaccessible. In order to direct attention to this important problem we have secured data on three of the diseases reportable by law which have originated in certain hospitals. These may give some index to the prevalence of institutional infection, most of which is preventable, in the average general service hospital. Our observations are not limited to one hospital but include several and we believe that most comparable institutions elsewhere, if they will investigate, will find some similarly startling truths. There is no thought in this paper of making an attack upon a particular administrator, board of directors, nursing staff, or any other individual or group. The institutions represented in this report are supported by us and we serve on their medical staffs. There is only one object in making the report; namely to call attention to existing conditions with the hope that these will be corrected, and that similar investigations will result in improvements in other hospitals throughout the country.

Scarlet Fever

Hospital R is a representative institution of about five hundred beds. In 1924 it cared for more than 9,000 patients, while in 1933 this number had increased to over 14,000. Table I reveals that during this period of ten years, one hundred and forty-four cases of scarlet fever originated within its walls and three deaths resulted from the disease. One-third of those who contracted the disease were patients, and two-thirds of them were personnel.

Diphtheria

Every general service hospital is confronted with occasional outbreaks of clinical and bacteriological diphtheria. Although some carriers will escape detection, the use of routine admission cultures, Schick tests and immunizations when indicated, combined with a proper ward technique should eliminate more or less completely the clinical disease of institutional origin. Routine examination must apply not only to each patient admitted but to each member of the personnel and, particularly to students visiting our teaching hospitals. In Table II one sees that 336 persons admitted for various conditions acquired diphtheria within hospital R during the past decade and that of 164 of these which were

TABLE II
DIPHTHERIA ORIGINATING WITHIN INSTITUTION R IN THE LAST TEN YEARS

ALL WARDS IN HOSPITAL EXCEPT PEDIATRICS AND CONTAGION

	—Patients—			Nurses		Internes		—Maids—			Orderlies
	Clinical	Carriers	Deaths	Clinical	Carriers	Clinical	Carriers	Clinical	Carriers	Deaths	Clinical
1924	8	3	1	9	10	..	..	2	2	1	1
1925	9	2	1	21	7	1	..	4	1	..	1
1926	7	3	..	14	5	1	1	3	..	..	2
1927	..	..	..	2	1	..	..	2	..	..	..
1928	..	..	..	3	..	1	..	..	..	..	..
1929	1	2	..	4	3	..	1	2	..	..	..
1930	..	..	..	..	..	..	..	..	..	..	..
1931	..	..	..	..	1	..	..	..	..	..	..
1932	..	..	..	..	..	..	..	..	..	..	..
1933	2	..	2	3	..	1	..	2	..	..	..
1934 to date	9	37	2	5	6	2	5	..	9	..	4
Totals	36	47	6	61	33	6	7	15	12	1	8

CROSS-INFECTIONS IN CONTAGION UNIT

	—Patients—		—Nurses—		Maids	Internes
	Clinical	Carriers	Clinical	Carriers	Carriers	Clinical
1924	..	2	..	..	..	..
1925	1	9	2	3	..	..
1926	..	1	1	..	..	..
1927	..	3	..	..	..	..
1928	1	..	1	..	..	..
1929	..	..	2	1	..	..
1930	..	..	..	1	..	..
1931	..	..	..	..	..	..
1932	..	..	..	2	..	..
1933	1	..	1	1	1	..
1934 to date	1	..	1	..	..	1
Totals	4	15	8	8	1	1

TABLE I
SCARLET FEVER ORIGINATING WITHIN INSTITUTION R IN THE LAST TEN YEARS

	On All Wards Except —Contagion and Pediatrics—					On Contagion —Wards Only—				Pediatrics —Only—		—Deaths—	Total Cases	
	Patients	Nurses	Internes	Maids	Orderlies	Patients	Nurses	Internes	Maids	Patients	Nurses		Patients	Personnel
1924	3	12	1	2	2	..	6	..	1	1	..	1 pt. on general ward	4	24
1925	3	4	2	2	..	1	8	1	..	5	3	.....	9	20
1926	10	10	1	..	..	..	5	1	..	6	5	.....	16	22
1927	..	1	..	..	..	..	3	..	..	2	1	.....	2	5
1928	..	1	..	..	..	2	..	..	..	1	2	.....	3	3
1929	..	3	..	..	..	..	7	..	..	4	..	1 pt. on pediatrics	4	10
1930	..	..	..	..	..	..	..	..	..	..	..	.....	..	..
1931	..	..	..	..	..	..	2	..	1	1	..	1 pt. on pediatrics	1	3
1932	2	5	..	..	1	1	2	1	..	3	1	.....	6	10
1933	..	..	..	..	..	..	..	..	..	..	1	.....	..	1
1934 to date	1	..	..	..	..	..	..	..	..	..	..	.....	1	..
Totals	19	36	4	4	3	4	33	3	2	23	13	3	46	98

PEDIATRICS ONLY

	Patients			Nurses		Internes
	Clinical	Carriers	Deaths	Clinical	Carriers	Clinical
1924	3	8	1	1	..	..
1925	4	11	1	2	..	..
1926	7	9	5	2	..	..
1927	3	10	1	..	..	..
1928	1	..	..	..	..	..
1929	2	8	..	2	1	1
1930	..	..	..	..	..	..
1931	..	..	..	..	..	..
1932	..	..	..	..	..	..
1933	..	..	..	..	..	..
1934 to date	..	1	..	..	1	..
Totals	20	47	8	7	2	1

TOTALS

	Clinical	Carriers	Positives Cultures	Deaths
1924	24	25	49	3
1925	45	33	78	2
1926	35	19	54	5
1927	7	14	21	1
1928	7	..	7	..
1929	13	16	29	..
1930	..	1	1	..
1931	..	1	1	..
1932	..	2	2	..
1933	10	2	12	2
1934 to date	23	59	82	2
Totals	164	172	336	15

clinical cases fifteen lost their lives. Simple measures no doubt could have prevented most of this.

In Table III attention has been called to an outbreak of diphtheria which occurred in hospital R recently.

TABLE III
OUTBREAK OF DIPHTHERIA IN INSTITUTION R

	Clinical	Carriers	Total	Repeaters	Deaths
CROSS-INFECTIONS IN CONTAGION UNIT					
Nurses	2	1	3	1	..
Patients	2	..	2	..	..
Internes	1	..	1	..	..
	5	1	6	1	..
OUTBREAK IN REMAINDER OF HOSPITAL					
Patients	11	37	48	7	2
Nurses	8	6	14	15	..
Maids	2	9	11	3	..
Internes	3	2	5	2	..
Orderlies	4	..	4	1	..
Graduate Physicians	..	3	3	2	..
	28	57	85	31	2
Totals	33	58	91	32	2

In December, 1933, one interne, two nurses and two orderlies in this institution developed clinical diphtheria. During the first week of January, 1934, another nurse became ill with diphtheria. These persons worked on different stations. Approximately three weeks later, a patient convalescing from skull fracture, died of pharyngeal and laryngeal diphtheria, after having been in the hospital for ten days. Unfortunately, this diagnosis was made at post mortem. The last few days of his life, he complained of sore throat but no cultures were taken. It was suggested that there must be a diphtheria carrier in the hospital but no attempt was made for some time to combat the situation and finally the entire hospital at the request of the health department was placed under quarantine for two weeks. During the earlier part of this period, daily mass cultures were taken. A student nurse who had been reported as a carrier in 1932, was now working on a surgical station and again found to be a carrier. Following this it was found that 11 cases of diphtheria were easily traced to her of which number six were clinical cases and one had died. This was a surgical case whose diphtheria was not detected until two days before death.

On another surgical station, it was observed that most of the cases were occurring on one service. Observation revealed the fact that a physician on this service was a carrier. Fifteen cases, two of which were clinical, were then more or less directly traced to him. He probably carried the infection to another ward, where the patient he saw in consultation became a carrier as well as the attending nurse.

A week after the hospital was released from quarantine, an interne who had been found to be a Schick negative carrier and later released was found to have clinical diphtheria. While ill and before reporting his symptoms, he had been in approximately all parts of the hospital over a period of about four days. Mass cultures were again taken of the entire hospital and four stations had to be quarantined for one week. Not long after this, the pathologist who had been immunized years before, was found to be a carrier of virulent diphtheria organisms. It was not until his sinusitis was satisfactorily treated that he was found to have negative cultures. A little later, another interne who at one time had been immunized, developed clinical nasal diphtheria. His service took him over many parts of the hospital so that mass cultures had to be taken again, as a result of which more carriers were found. Although the outbreak of diphtheria among adults was quickly brought under control, occasional clinical or carrier cases developed for a month after release from quarantine. It was found that a number of carriers managed to secure enough negative cultures to allow them to return to duty, after which new cases were found among their contacts. Some carriers had to be re-isolated as many as eight times, being in quarantine as long as four months. Thirty persons were re-isolated a total of eight times. Guinea pig virulence tests were done on all carriers who remained in quarantine longer than one week. All but two were found to have virulent diphtheria organisms, suggesting that all acquired the same strain of organisms from the same primary source.

In one of the surgical cases who died, diphtheria bacilli were found in the alveoli of the lungs and in the cholecystectomy wound. All carriers who remained in quarantine longer than one week had X-ray examinations of the para-nasal sinuses. Of the 70 per cent who were thus examined, seventy-five per cent showed X-ray evidence of sinusitis. In a good many of them, sinus washings contained diphtheria bacilli. From such cases, it was difficult to secure negative cultures. A barrier was made consisting of three negative cultures followed by one week off duty during which time daily cultures were taken.

Some objection arose to the strict measures used in the work with carriers. The following two cases show that not to do this is a dangerous procedure. One patient who had become a carrier while in the hospital finally had three negative cultures which were required on discharge from isolation. However, he had evidence of sinusitis. A month later a woman at whose home he was staying in another city, died of clinical diphtheria, and a practical nurse also contracted the disease. Another carrier released in the same way and who also had sinusitis, apparently transmitted the disease to an adult brother who developed clinical diphtheria and two new carrier cases were then found in their home. A visitor at this home also acquired clinical diphtheria.

We feel confident that practically all of the diphtheria which occurred in this hospital in the past ten years, including the recent outbreak, could have been prevented by procedures which are known to be effective. This hospital of about eight hundred inhabitants contributed more cases of diphtheria than an entire city of 500,000 people did.

Puerperal Infection—A Contrast

As table IV shows, the obstetrical ward of this representative hospital has been comparatively free of puerperal infections. This ward is located in the same building as the general duty wards. Two facts explain why this obstetrical ward has a better record than most isolated maternity hospitals: (1) Only one-sixth of elective operations performed in the hospital are done here; this hands-off policy introduces less infection, and (2) a rigid aseptic technique being the responsibility of *one* person. In the delivery room all the details of a surgical operation are observed, and on the wards a careful technique is used. To illustrate the value of the technique used, it may be added that not one carrier or clinical case of diphtheria was found in the obstetrical department during the recent diphtheria outbreak. The amount of puerperal sepsis *can* be kept low in a general service hospital, as this example shows, but it requires a careful supervision of every detail.

TABLE IV
PUERPERAL INFECTIONS IN REPRESENTATIVE HOSPITAL

	—1930—		—1931—		—1932—		—1933—	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Patients Delivered	1039	...	1271	...	1708	...	1838	.....
Febrile Morbidity*	81	7.7	65	5.1	145	8.04	115	6.25
Puerperal Fevers	25	2.4	38	2.9	48	2.3	62	3.37
Other Causes.	56	5.3	27	2.1	97	5.6	43	2.3
Deaths from Sepsis	3	0.29	1	0.079	3	0.17	1	0.054
Elective Operations	52	5.04	68	5.3	97	5.6	102	5.54

*Febrile Morbidity according to Am. College of Surgeons' Classification: 100.4 deg. F. for two successive days at any time while in the hospital.

Tuberculosis

Since 1920, observations have been made on tuberculosis as it developed among the student nurses of hospital R. During the early years of this work, the observations had to do only with those who actually fell ill. But for the last five or six years, tuberculin tests have been administered to the probationers and all who react negatively have periodic tuberculin tests administered as long as they are negative. This is the most delicate indicator of spread of infection we have. The test has revealed a situation not to be proud of. For example, of the students entering the school of nursing as probationers in 1929, 1930, 1931 only 31.9 reacted positively to the tuberculin test. As early as the first half of the senior year, sixty-seven per cent were contaminated with tubercle bacilli so as to react positively to tuberculin. Inasmuch as the tuberculosis service of these nurses is given in the senior year, a much higher incidence of positive reactors would be expected by the time of graduation. Thus the tuberculosis problem among student nurses had been more than doubled. This would have been acceptable in the days when we believed that a positive tuberculin reaction was an asset, but with evidence now deemed adequate we are convinced that positive tuberculin reaction indicates a double health liability and that every girl whom this institution contaminates with tubercle bacilli becomes a potential case of clinical tuberculosis.

A positive tuberculin reaction indicates that there are tubercle bacilli in the body. While these bacilli of first infection usually become encapsulated, there is, at any time, the danger of their being set free on allergic tissues, where they often cause illness and destruction.

During the past three years, nine nurses have been obliged to leave the school of nursing, not because they had only positive tuberculin reactions, but because they were ill of this disease. In short, seven per cent of each class entering training has acquired symptom producing tuberculosis in line of duty. Their disease was not discovered by any survey aimed at prevention, but came to the attention of the hospital authorities only when they asked for help after having acquired symptoms of tuberculosis. This situation is particularly pathetic when one realizes that practically all of this contamination could have been prevented. The opportunity and the obligation were neglected.

There are two main sources of contamination with tubercle bacilli of student nurses in hospital R. Each girl in this school of nursing is re-

quired to take a tuberculosis service in institution A, which practices the usual sanatorium technique which is not adequate to prevent contamination. This service is valuable to the students and we strongly recommend that it be continued but primarily as a teaching service where the work is done by paid help. It will thus be possible to concentrate patients desirable for teaching in one small part of the institution. Strict contagious technique can be employed without any great expense. To introduce such technique in a large institution means an expenditure of money, but this is insignificant when compared to the health and even the lives of our students. Years ago we provided safety devices in order that employees in institutions could be protected against injury. It is far more important in hospitals to provide safety from exposure to disease.

Another source of contamination of student nurses in institution R is rather serious. It is the patient who has unrecognized tuberculosis co-existing with the condition for which he is admitted. He may enter for a cataract operation, a fracture, diabetes, or any other condition, and at the same time have frank tuberculosis, which has never been suspected or which may be kept secret when his history is taken and remains secret due to neglect in routine tuberculin testing and X-ray studies of positive reactors. It seems almost unbelieveable that with our present knowledge of the detection of tuberculosis many of our student nurses should be contaminated with tubercle bacilli by caring for such patients. The following case is a good example:

On February 2, 1934, there was admitted to one institution, a man of forty-nine years, because he recently had some difficulty in breathing, loss of weight and cough. His throat appeared red and there was a greyish-white membrane over the right tonsil. A tentative diagnosis of diphtheria was made and 20,000 units of diphtheria anti-toxin were administered. His throat condition did not respond to this treatment and further examination led to a suspect diagnosis of mucous patches. Because of a rectal condition he was transferred to a surgical service for treatment. He died approximately six weeks after entering the hospital. Postmortem examination revealed pulmonary tuberculosis with cavitation, wide-spread tuberculosis of the pharynx, larynx, intestine, prostate and skin, with miliary tuberculosis of the liver, spleen and kidneys. A routine tuberculin test on admission and X-ray of positive reactors would have revealed the lung condition and six weeks of exposure to students of nursing, internes, resident physicians, graduates in nursing and all others who came in contact with him would have been prevented.

Within the last two years, employees of this institution have been examined and one of them had chronic pulmonary tuberculosis. Thus, not only are unsuspected cases of tuberculosis being admitted to the hospital, but employees of the institution are allowed to go about their work disseminating tubercle bacilli. The solution of this problem is simple. It consists of administering the tuberculin test to all patients seeking admission to the hospital, as well as all employees and all applying for positions in the institution. A single X-ray film of the chest of the positive reactors will detect practically every case of pulmonary tuberculosis from which tubercle bacilli are being disseminated to others. For emergency cases, the tuberculin test may be omitted and the X-ray film examination done at once.

In hospital B which is a general hospital but has a tuberculosis service it has been observed that from fourteen to forty per cent of the probations react positively, whereas from eighty-six to one hundred per cent have become contaminated with tubercle bacilli by the time of graduation. In Hospital C which does not have a tuberculosis service but which admits tuberculous patients the incidence of positive reactors among probationers varies from twenty-two per cent to thirty-one per cent, but on graduation it varies from twenty-five per cent to forty-two per cent. In hospital D, the incidence of positive reactors varies from twenty-five per cent to thirty-two per cent but on graduation it varies from twenty-five per cent to forty-eight per cent. This is in rather sharp contrast with institution B, which is a school of education with no service which requires contact with tuberculous patients. Here we have found that the incidence of positive reactors among the entering students is approximately twenty-three per cent. Among the same class during the senior year, the incidence is approximately twenty-seven per cent. It is obvious that we must protect the student nurse against exposure to tuberculosis.

Contagious Diseases Are Costly

Table V is a very conservative estimate of the price that one community has had to pay during the last ten years because of some of the communicable diseases that have originated within one hospital. The loss to the community is, of course, much greater than these figures can reveal. The life ambitions, the very lives, of nurses and internes have been at stake. These factors are hard to evaluate in terms of dollars.

TABLE V

ECONOMIC LOSSES TO THE COMMUNITY CAUSED BY COMMUNICABLE DISEASES ORIGINATING WITHIN A REPRESENTATIVE HOSPITAL DURING THE LAST TEN YEARS

SCARLET FEVER—		
145 cases; 3,325 quarantine days at $2.80 a day for hospitalization	$ 9,338.00	
Salaries of 94 of the personnel paid while not working at $1.00 a day	22,500.00	
3 deaths at average value of $7,500 for a human life	2,162.00	
	$ 34,000.00	$ 34,000.00
DIPHTHERIA—		
The 1934 Outbreak Alone—		
50 patients in quarantine 874 days at $2.80 a day for hospitalization.	2,427.00	
41 of the personnel in quarantine 1,849 days at $2.80 a day for hospitalization	5,237.00	
Salaries of 41 of the personnel paid while not working at $1.00 a day	1,849.00	
Cost of sending new charity patients to other hospitals during quarantine	5,000.00	
Culture, media, stains, etc.	600.00	
2 deaths at average value of $7,500 for a human life	15,000.00	
	30,113.00	30,113.00
In the Other Years—		
245 persons; average of 17 days; 4,165 days in quarantine at $2.80 a day	11,662.00	
Salaries of 170 of the personnel paid while not working; 3,090 days at $1.00	3,090.00	
13 deaths at average value of $7,500 for a human life	97,500.00	
	112,252.00	112,252.00
TUBERCULOSIS—		
Average of 3 nurses a year; 30 in 10 years; average hospitalization 6 months, 5,475 hospital days at $2.80 a day	15,222.00	15,222.00
Total		$191,587.00

Prevention

The ideal of a glass house and a perfect contagion technique around each patient in a general service hospital is something to strive for, but is hard to attain without the expenditure of much money. The hospital that has all its patients in private rooms has less trouble in achieving this ideal than does the old type hospital with many large wards. Today fewer young women are entering hospitals as student nurses, and as a consequence nursing services are becoming inadequate. For a good technique there must be plenty of help; graduate nurses must be hired when student nurses are not available, and of course they must be paid. Moreover, student nurses are continuously changing services; close supervision must be had over them, especially when they come on a new service. All of this means an expenditure of energy on the part of authorities to see that rules are adhered to.

We feel that a more rigid technique ought to be followed in every hospital. A comprehensive plan should include:

I. Examination of the personnel:

1. Before being engaged to work in the hospital, each worker must submit to:
   (a) A thorough physical examination.
   (b) An X-ray examination of the chest.
   (c) A Wasserman test.
   (d) Tuberculin, Dick, and Schick tests.
   (e) Immunizations against Scarlet Fever, Diphtheria, Smallpox and Typhoid Fever.
   (f) Nose and throat culture, to be repeated at intervals.
2. Periodic physical examinations.
3. All employees must report the onset of all unusual symptoms in themselves on penalty for failure to do so. But they must not be forced to make up time lost unless they are gone from duty for several weeks.
4. One person should have the responsibility of supervising the health of the personnel and to keep proper records.

II. Admission of Patients:

1. Each patient should receive:
   (a) A brief physical examination no matter what may be the admission diagnosis.
   (b) A routine X-ray examination of the chest of positive reactors to tuberculin.
   (c) A Wasserman test.
   (d) A urethral and vaginal smear where indicated.
   (e) A smear of all suppurative discharges.
   (f) Agglutination tests where there is a history of obscure protracted fevers or dysentery.
   (g) A nose and throat culture as a routine procedure when they are admitted to the hospital.
2. Close contact of the medical attendant with the patient is to be avoided.
3. The hands of the medical attendant are to be washed with soap and water after attending *each* patient, after which a suitable hand lotion is to be used. The public would be shocked to learn that medical attendants scarcely ever wash their hands between patients. A cart with basins of water and other necessary articles can be wheeled down the ward, so that every ward may have this technique. After all, clean hands are the simplest and the most effective safeguards against the spread of infection.

4. Separate isolation of the new patient until nose and throat culture reports have been received (this may be hard to do in a large hospital with large wards).
5. A routine form easily filled out by means of check-marks should be used in receiving, giving:
   (a) A history of recent exposure to communicable diseases if known.
   (b) Previous communicable diseases the patient has had.
   (c) Immunizations the patient has received, with dates.
   (d) Permission by the patient to allow the staff to perform necessary emergency operations, or by the parent when the patient is a minor.

III. Routine Care of Patients:

1. Every effort should be made to isolate each patient from every other. Private rooms for patients make this easier. Attendants must wash the hands after attending each patient.
2. Patients found to have the adult type of tuberculosis, pneumonia, or a positive diphtheria culture must be isolated as well as those having the acute exanthemata.
3. Supervising nurses should make rounds twice daily; a patient with a cold or rash should be immediately isolated until such time as the attending physician says that they are non-contagious. Records of the number of colds arising should be kept.
4. Medical attendants should receive frequent drills and instructions in technique. Their enthusiasm must be renewed at times.

IV. "Training" in Tuberculosis Wards:

1. Nurses should be employed to attend the tuberculous, and they should be paid in an amount commensurate with the risk involved.
2. Tuberculous patients should be isolated and strict contagious technique should be used.
3. Nurses can be taught all that they need to know in one ward set aside for this purpose. It is wrong to expose student nurses so that hospitals and sanatoria may have cheap labor.

Conclusion

The general service hospital is often a cesspool of infections. In one representative hospital here presented, the loss to the community is at least nineteen thousand dollars a year because of scarlet fever, diphtheria, and tuberculosis originating in the hospital. Many deaths occur because of infections contracted while in the hospital. General service hospital administrators either are not aware of these facts, or show too little interest in the subject of Aseptic Technique. Much has been done in maternity and pediatric hospitals to decrease the amount of cross infection but little has been done in the general service hospitals. It is time that energetic measures be taken to stop such infections in the general hospitals, or the public itself will demand that something be done. Aseptic Technique is of value; its value has been shown repeatedly in specialty hospitals. We recommend to the profession that similar investigations be made in hospitals elsewhere to see that measures are taken to prevent the spread of contagious and infectious diseases.

The
JOURNAL
LANCET

Represents the MINNESOTA, NORTH DAKOTA, *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

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South Dakota State Medical Association
Montana State Medical Association
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MINNEAPOLIS, MINN., NOVEMBER 1, 1934

MATERNAL VERSUS ARTIFICIAL FEEDING OF INFANTS

Despite the variability characteristic of the chemical composition of different samples of breast milk, nevertheless, the secretion of the human breast uniformly excells all known artificial foods in promoting normal nutrition and optimum health in infants. Apparently the range of functional adaptability of the infant's digestive ferments is adjusted to cope more successfully with these variations than with the special demands required for the proper utilization of alien milks. The beneficial influence of maternal feeding is reflected not only by a lower infant death rate[1] for the first year of life, but also by superior physical and mental development.[2]

The establishment of lactation is the result of intricate physiological processes. In all probability, the enlargement of the mammary gland associated with puberty and estrus cycles is a response to hormonal stimulation. According to Corner,[3] prolonged administration of corpus luteum extract stimulates a glandular proliferation that proceeds only to the stage attained normally at puberty. The administration of extracts of whole pituitary, however, stimulates the breast to proliferate and to secrete milk, but fails to duplicate fully the condition of normal lactation. This hormone designated as prolactin which presumably activates the proliferation and function of milk-secreting cells is a product of the anterior pituitary. After the secretion of milk has been initiated by hormonal action, the act of suckling and the removal of milk from the breast operates to prolong the secretory activity of the gland,[4] and to prevent cessation of its milk producing function. Simple procedures, namely nursing and manual or mechanical emptying of the breasts, known to sustain the functional activity of the mammary glands at or near their maximum physiological capacity determined by antecedent complex hormonal influences and anatomical conditions can be recommended by all faced with the responsibility of supervising the feeding of infants, as valuable measures directed toward providing infants with the food that excells in promoting optimum health, nutrition, and development.

The special advantages of maternal over artificial feeding seem to terminate three or four months before the first birthday is reached, thus certain benefits accrue from weaning at the age of 9 or 10 months as is commonly practiced in this country. This transition combined with the addition of solid foods to the diet is a function of the physician, who on the basis of knowledge and experience can individualize these changes to the advantage of the baby.[5]

C. A. S.

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INSURANCE POLICIES SHOULD BE READ

The average person buys and accepts his insurance largely on the confidence that he has in the soliciting agent, forgetful that this agent is a salesman. And who has not discovered during the past ten years of feast and famine that a salesman may be quite as selfish as anyone else?

Fire insurance policies are standardized according to the prescribed requirements of the various state insurance commissioners, and straight life policies have pretty much the same provisions everywhere but when it comes to sick and accident, casualty or liability insurance no one can just put a hand in the bag and draw out of it a policy with the same uniform assurances of protection.

When the policy is received, the indemnifying provisions are there in bold type. They are easily read and the large figures are found to correspond with the previously had conversation so the document is quickly laid away in a safe repository from whence its prudent warranties may be evoked in cases of misfortune or impending danger.

Should occasion ever demand that it again be brought to the light of day, it will be discovered, perhaps for the first time, that there is much fine print contained in the contract. The chances are that this occurrence is not due to any suddenly discovered paper famine but rather to a charitable consideration for the insured, an earnest desire to spare him the apprehensions and misgivings that a ready perusal of the exceptions and exclusions might have brought to mind.

Some policies permit the use of X-rays for picture work and diagnostic but not therapeutic purposes. All exclude claims which arise from criminal acts or a state of intoxication on the part of the assured; but in such cases, the burden of proof is upon the insurance company. It may also be noted that it does not cover property damage as for a torn garment. In short, the policy should be read especially with reference to exclusions because it is not so much what a company will do as what it will not do that makes its insurance different from that of another. The policy, a copy of which is in the hands of each party, recites the provisions of the contract and believe it or not the fine print is no unimportant part thereof.

A. E. H.

CRESWELL T. PIGOT, M.D.

Creswell T. Pigot was born in London, Ontario in 1878 and died at his home in Roundup of lobar pneumonia, Oct. 12, 1934, after an illness of four days. Mrs. Pigot, one son, Creswell, Jr., and a daughter, Susan, many relatives and the whole of the medical profession mourn his untimely death.

Dr. Pigot graduated from the University of West Ontario Medical School, London, in 1900 and located in Butte, Mont., in 1902. In 1910 he removed to Roundup, being one of the first physicians in that place, and quickly gained an enviable reputation for good work and honorable dealings.

In 1915 Alice Lowry of Butte became Mrs. Pigot and together they established a real Montana home.

Dr. Pigot by his winning personality and his ability has held many positions of trust in Roundup and in the state, particulary in the medical organization. Of the Medical Association of Montana he has been treasurer, president, and delegate to the A. M. A. for thirteen years. He was in the Army Medical Corps during the World War. Served on the State Board of Health and on the City and County Boards of Health. He helped organize the Roundup Chapter of the American Legion. He brought golf to his home city. He was active in everything pertaining to the village of Roundup which built it to one of the nicest and most modern little cities of the state. It is needless to remark that in the passing of Creswell Pigot the state has lost one of its most useful citizens.

E. G. B.

NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. E. A. Doles, Havre, was recently married to Miss Claremae Vielleux of Fort Benton, Mont.

Dr. W. A. Wright, Williston, N. D., is spending several weeks in Boston, Mass., where he is taking a post graduate course.

Dr. Harold Reese, a graduate of the Rush Medical College, has opened offices at Rose Creek, Minn., for general practice.

Dr. F. A. Richards, Sturgis, S. D., is spending several weeks in the eastern cities, visiting different clinics in the study of children's ailments.

Dr. W. E. Moorhead, Owatonna, Minn., was awarded a membership in the American College of Surgeons at their annual meeting at Boston last month.

Dr. Donald Church Balfour, member of the Mayo clinic at Rochester, Minn., was elected president of the American College of Surgeons for 1935-36.

Among the prominent surgeons to be honored by election to membership of the American College of Surgeons, will be Dr. John Thabes, Jr., Brainerd, Minn.

Dr. R. R. Chapple, who has recently been granted a certificate to practice medicine in Montana, has decided to open offices at Billings for general practice.

Dr. Edwin E. Webber, West Duluth, Minn., has been elected a member of the American College of Surgeons at the annual meeting held at Boston last month.

Dr. O. S. Ely, city physician of St. Paul, was severely injured in an automobile accident recently, being obliged to have about 30 stitches taken in cuts on his face and neck.

Dr. Herbert W. Jones was named president, Dr. W. A. Fansler, vice president, and Dr. M. O. Henry, secretary, of the Northwestern Hospital staff at their recent annual meeting.

Dr. Edward W. McEssy, Fargo, aged 55 years, died at a Moorhead hospital after a short illness, of heart trouble. Dr. McEssy had been in active practice in North Dakota for over 25 years.

Dr. R. S. Westaby, Madison, S. D., was among the large number of Northwestern physicians that attended the annual meeting of the American College of Surgeons, held at Boston last month.

Dr. J. D. Hobson, Missoula, Mont., passed away last month after a short illness of pneumonia. Dr. Hobson was active in his medical society work, being secretary of the society for many years.

The American College of Surgeons has notified Dr. J. D. Carr, superintendent of the North Dakota State Hospital for the insane, Jamestown, that said hospital has been awarded *full approval* by that college for the year.

Dr. J. Murphy, who has been on the staff of the Rosebud Indian hospital, Greenwood, S. D., for a number of years, has been transferred to Durango, Colorado. He will be in charge of the Indian hospital at that place.

The annual meeting of the South Dakota Hospital Association recently held at Huron, elected the following officers: G. A. Campbell, Huron, president; C. M. Austin, Sioux Falls, vice president, and Geo. Kienholz, secretary.

Dr. William R. Bagley, Duluth, has been elected president of the St. Louis County Medical Society for the coming year. Drs. P. S. Rudie and E. N. Peterson will serve as vice presidents, and Dr. M. G. Gillespie, secretary.

Dr. E. A. Meyerding, St. Paul, executive secretary of the Minnesota Public Health Association, and Miss Marguerite Breen, educational director, were speakers at a meeting of the Winona County Public Health Association last month.

Drs. A. W. Morse, Butte; J. M. Graybeal, Missoula; G. A. Lewis, Roundup, and L. G. Dunlay, Anaconda, attended the annual meeting of the American Acadamy of Ophthalmology and Oto-Laryngology, recently held in Chicago.

Dr. Chas. Houtz, Havre, Mont., is in Philadelphia this month, where he will attend the annual meeting of the American College of Surgeons. Before the doctor returns, he will attend clinics at New York, Pittsburgh and Cleveland.

Members of the medical society of Devils Lake, N. D., had Dr. Howard K. Gray, Rochester, as their guest speaker at the October meeting, presenting a paper on "Surgery of the Bilinary Tract." Dr. J. C. Fawcett is president and Dr. G. F. Drew, secretary of the District Society.

Dr. and Mrs. B. R. Kirklin and Dr. and Mrs. A. R. Barnes, Rochester, Minn., have left for an extensive visit in Europe, where Dr. Kirklin will deliver several addresses and represent the Mayo Clinic in the presentation to Mussolini of a scroll sent from Rochester, and where Dr. Barnes will visit several clinics.

The Park Region Medical Society held their annual meeting at Alexandria, Minn., last month and elected Dr. E. J. Tanquist, Alexandria, president, and Dr. N. A. Baker, Fergus Falls, secretary. After partaking of an elegant dinner, several interesting papers were presented and discussed by the members.

An extensive building program is being carried out at Fort Meade Hospital, S. D. Five new buildings are being built for storage and general utility, two of which are approaching completion, all are 150 feet long and at least 42 feet wide. An additional building is just started to add to the capacity of the hospital.

Dr. Dan Mellon, Rome, N. Y., was elected president of the resident and ex-resident physicians of the Mayo clinic and foundation at the annual meeting at Rochester, Minn. Other officers are Dr. Stanley J. Seeger, Milwaukee, and Dr. Lee Pollock, Rochester, vice presidents. Dr. Thomas J. Kinsella, Oak Terrace, Minn., secretary.

The District Medical Association convened at Aberdeen for their fall dinner program, Dr. E. F. Rodda, Minneapolis, being the main speaker; his topic was "Acute Abdomen in Children." Dr. J. O. F. Kraushaar, Aberdeen, spoke on "The Present Status of the Medical Relief Question." Dr. Wm. G. McGee, Watertown, president of the South Dakota State Society, was also a guest speaker. Dr. E. A. Pittenger is president of the Aberdeen Society, and Dr. John L. Calene, secretary.

Stricken with lobar pneumonia, Dr. Creswell T. Pigot, former president of the Montana State Medical Association, and widely known physician, died at his home on October 12. Dr. Pigot had practiced in Montana since his graduation from Toronto (Can.) University in 1902. He first went to Butte, and in 1910 moved to Roundup. Since leaving the presidency of the state association, he had been its delegate to the American Medical Association. Dr. Pigot was a medical officer in the army during the war. He is survived by his widow and two children.

The Mount Powell Medical Society met in Philipsburg, Mont., last month, with the following program. "Infantile Paralysis," Dr. E. G. Wilcox, Drummond. "Truly Rural Remarks of a Country Practitioner," Dr. A. C. Knight, Philipsburg. "Early Montana Doctors," Judge Durfee, who has lived in western Montana over fifty years. Report of the Montana State Permanent Committee on Medical Practice and Economics by Dr. J. C. Shields, Butte. A social session followed. Next meeting to be held November 13, at Galen, Montana State Tuberculosis Sanitarium.

Sixteen hospitals in Minneapolis and eleven in St. Paul have been given approval of the American College of Surgeons, as follows: Minneapolis—Abbott, Asbury, Eitel, Fairview, Hill Crest Surgical, Lutheran Deaconess, Maternity, Minneapolis General, Northwestern, St. Andrew's, St. Barnabas, St. Mary's, Shriners' Hospital for Crippled Children, Swedish, University and Veterans. St. Paul—Ancker, Bethesda, Miller, Children's, Gillette State Hospital for Crippled Children, Midway, Mounds Park Sanatorium, Northern Pacific Beneficial Association, St. John's, St. Joseph's and St. Luke's.

A special program of lectures and demonstrations in medicine will be held under the direction of The Mayo Foundation from December 3 to 7, inclusive. Mornings will be devoted to surgery and dry clinics. In the afternoons and evenings medical and surgical subjects, including cardiovascular diseases, diseases of the nervous system, artificial fever, roentgen and radium therapy, laryngology, oral and plastic surgery, gynecology, diseases of the endocrine glands and orthopedics, will be discussed. While this program is arranged primarily for the Fellows of The Mayo Foundation, visiting physicians are invited to attend.

Physicians of the seven Minnesota counties in the Deerwood Sanatorium district were invited to attend a short course on tuberculosis held at the sanatorium October 26, under the auspices of the Minnesota Public Health Association. The program was started after physicians had an opportunity to examine patients and discuss cases with the visiting clinicians. Included in the evening's program were lectures by Dr. S. A. Slater, superintendent of Southwestern Minnesota Sanatorium. Dr. J. A. Myers, professor of Preventive Medicine, University of Minnesota; Dr. F. F. Callahan, superintendent of Pokegama Sanatorium; Dr. E. A. Meyerding, executive secretary of the Minnesota Public Health Association, and a demonstration by Dr. E. G. Hubin, superintendent of Deerwood Sanatorium.

The JOURNAL LANCET

Minneapolis, Minnesota
November 15, 1934

New Series
Vol. LIV, No. 22

Bronchoscopy and General Medicine*

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Fargo, N. D.

IN MEDICINE, one does not become an oracle overnight. There is no royal road to success, except it be built at the expense of arduous labors, founded upon experience and proven by time. Please understand, then, that I am speaking, not as an originator, but rather attempting to transmit to you the results of the enormous experience of that intrepid pioneer, and his group of brilliant disciples, whose name has become synonymous in this country with bronchoscopy, Chevalier Jackson.

Not only was it my good fortune to participate in that very thorough two-week didactic course given by the group of bronchoscopists in Philadelphia headed by Chevalier Jackson, Louis H. Clerf and Gabriel Tucker, but particularly to act as second assistant to Louis H. Clerf, Professor of Bronchoscopy at Jefferson Medical College, in the Bronchoscopic Clinic at Jefferson Hospital in Philadelphia. I am deeply indebted to Dr. Clerf for the careful and sympathetic introduction to the *art* of bronchoscopy, and because he very kindly opened his records to me, and allowed me to have slides made from films of his cases. I have also quoted freely from the writings of all of the group.

The term, bronchoscopy, has become somewhat of a misnomer in its present day scope, *but* this seems to be by common consent and usage. The true term is Peroral Endoscopy, which includes *all* inspection and manipulation, through straight and rigid tubes, of the larynx, tracheo-bronchial tree, esophagus and stomach.

I noticed some raised eyebrows when the term, "bronchoscopic clinic," was mentioned. May I call your attention to the fact that bronchoscopy is no longer that mysterious sleight-of-hand performance by which previously inaccessible foreign bodies are whisked from the air and food passages of the body. Jackson[4] states that the time is practically at hand when every well rounded group, be it hospital, clinic or loose association, will include an actively functioning and well trained bronchoscopic team. In Philadelphia, at the present time, there are at least thirteen actively functioning bronchoscopic clinics in as many hospitals.[1]

You may well ask, "What does such a clinic do? Does it sit around and wait for people to inspire or swallow foreign bodies, and then remove them?" No, that is not the case. According to the statistics collected in Philadelphia, foreign body removal constitutes two or three per cent of the cases handled in the bronchoscopic clinics. Possibly the best way I can demonstrate this is to cite you a summary of the work done at the clinic during one of the weeks in February while I was there:

*Read at the meeting of the North Dakota State Medical Association, Fargo, May 28-29, 1934.
†From the Fargo Clinic.

Diagnostic Laryngoscopy	2
Treatment Laryngoscopy	3
Diagnostic Bronchoscopy	8
Treatment Bronchoscopy	30
Diagnostic Esophagoscopy	3
Treatment Esophagoscopy	5
Retrograde Bouginage of the Esoph.	5
Hydrostatic Dilatation of the Esoph..	1
Foreign Body of the Esophagus	1
Total	58

I wish that I could run over with you the history and findings of these cases, for each one is extremely interesting. I have never spent a period of my life at more fascinating work than when connected with the clinic at Jefferson. I must pay tribute to the manner in which it was conducted. *There* the bronchoscopist was no mere technician doing the bidding of the internist, surgeon or general practitioner. A complete history was elicited from each patient entering the clinic, and then each member of the staff made an independent physical examination, and elicited further history, if possible. Necessary incidental laboratory examinations and a complete roentgen examination were then made. *Then* a comparison of physical findings of the staff members was made, and an attempt at diagnosis before reading the roentgen report, or, as was always done, inspecting the films personally. Finally, revision of the diagnosis, if necessary, after roentgen consultation, and then decision as to procedure. Endoscopic examination was undertaken only if considered indicated by the chief. If secretion or tissue was removed, it was submitted to the laboratory. Even then several bronchoscopies and the use of radiopaque media were often necessary. Finally, after all reports were in, the diagnosis was arrived at. The great interest lay in having such a large number of diagnostic enigmata solved in such a comparatively short time, and, for the most part, so correctly and decisively.

There are a number of terms used by chest men and bronchoscopists to which I should like to call your attention. They are too often used loosely and interchangeably, and we must become exact in our use and meaning in order to have a common language.

Collapse of the lung is too general a term. There are several types of collapse, and we must define them:

Pneumo-Thorax—In pneumo-thorax the lung collapses away from the chest wall. The air is absorbed from the lung and it becomes a small mass hugging the mediastinum. Upon physical examination there is diminished expansion of the *affected* side of the chest. There is absence of vocal and tactile fremitus. There is marked hyperesonance. The breath sounds are absent. At fluoroscopy the mediastinum is seen to move from side to side with respiration. On inspiration it moves to the unaffected side, and on expiration to the affected side. The place of the air may be taken by fluid of some sort, giving a hydro, oleo, or pyo-thorax, with accompanying changes in the findings, although the relative position and significance of the collapsed lung remains the same.

Bronchial obstruction of varying types and degrees is responsible for several other important lung conditions. These may be explained in terms of valves.[2]

1. By-Pass Valve Obstruction. In this type of obstruction the lumen is simply narrowed; air can pass in both directions, but in diminished amount. If there is little obstruction, the findings may be absent, but as the degree increases, there is one cardinal finding. This is termed the asthmatoid wheeze by Dr. Jackson, but it has nothing to do with asthma. This wheeze is usually heard at the open mouth, best during deep breathing, and, unlike the true asthmatic wheeze, rarely at the chest wall.

2. Check Valve Obstruction. One of the first things observed on looking through a bronchoscope is that on inspiration the trachea and bronchi dilate markedly, and on expiration they become much smaller. With this in mind it is not difficult to see that as the obstruction in the air passage becomes more marked, a check valve is going to be formed, which will allow the air to pass one way, usually in, and not the other way. The result is that more and more air is trapped in the lung, causing an *Obstructive Emphysema.* Physically, the affected side of the chest is fuller, but the excursions are markedly limited. Tactile and vocal fremitus are lessened. There is marked hyperesonance. The breath sounds are markedly diminished. Under the fluoroscope there is hyperaeration of the affected side. The diaphragm is low and does not ascend with expiration. It is necessary to have views taken at the end of inspiration and the end of expiration to demonstrate and diagnose this condition on the film. Almost always, at first glance, one places the pathology on the wrong side of the chest, because of the fact that the hyperaerated lung looks so clear.

3. Stop Valve Obstruction. This is the result of increase in the obstruction till the air is not allowed to pass either way. The result is that the circulation rapidly absorbs the air from that portion of the tracheo-bronchial tree which is served

by the obstructed air passage, and Obstructive Atelectasis is the result. Physically, the affected side of the chest is flattened. There is diminished expansion. Tactile and vocal fremitus are diminished or absent. The percussion note is dull. Under the fluoroscope the affected region is dense. The trachea and mediastinum are drawn over to the affected side, and do *not* fluctuate with respiration. The diaphragm is drawn high, and *does not* descend with inspiration. Again, films at the end of both inspiration and expiration are necessary to demonstrate this.

There are always present a few organisms in the tracheo-bronchial tree. So long as ventilation and drainage are unimpaired, the defensive powers of the lung destroy these bacteria or limit their activity . But in the absence of such ventilation and drainage, as is the case when a complete obstruction is present, the defensive powers of the lung are so diminished that suppuration quickly follows, and that, together with the secretions from the membranes of the lung, causes a condition which has been named *Drowned Lung.*

Figure 1 illustrates the result of a complete



FIGURE 1

Obstructive atelectasis following complete obstruction of the left main bronchus. Complete recovery by aeration of the lung on the following day following removal of the obstruction.

obstruction of the left main bronchus. The whole side of the chest is dense. The trachea and mediastinum are seen to be drawn far to the left. If the diaphragm could be seen, it would be high. The accompanying film shows the startling rapidity with which these conditions often clear up on removal of the obstruction, as it is dated the following day, and the affected side of the chest is practically clear.

Jackson cites the following causes of valvular obstruction: (1) Foreign bodies; (2) benign growths; (3) malignant growths; (4) adenopathy; (5) anomaly; (6) inflammatory mucosal swelling; (7) granulations and granulomas; (8) secretions; (9) blood clots.

Apropos of some of the preceding conditions may I illustrate by citing a case report? A very well-nourished, forty-five-year-old white woman presented herself at the clinic with the complaint of paroxysmal attacks of coughing and dyspnea for the past fifteen months. They steadily became worse. These symptoms were aggravated on exercise. The patient stated that if she walked rapidly for a block, or climbed a flight of stairs, that she would become so short of breath as to necessitate sitting down immediately, before she could proceed. There was associated a marked wheeze, so much so, that it was a matter of comment among her friends and associates. The wheeze disappeared when the patient lay flat on her back. She had occasional pains in the anterior portion of her chest.

Our chest examination revealed diminished expansion over the upper half of the left thorax. Vocal fremitus and resonance were decreased over this area. No change in the percussion note was found. Breath sounds were markedly diminished over the upper left lobe when the patient was supine. During the first half of the inspiratory phase, breath sounds were absent, and at the middle of this phase, a sudden rush of air into the upper lobe was heard. When the patient sat up or leaned forward, the sounds came through almost normally over the left as over the right side. Some musical rales were heard over both sides. The roentgen report was negative. I wish also to emphasize that the roentgenologist was at fault in this case in not fluoroscoping the patient first, and then taking another film at the end of expiration as well as at the end of inspiration, as he then might have picked up an obstructive emphysema. I must say, also, that it very possibly was not there. The only thing the roentgenologist had to report was that there was a suggestion of an old pleurisy on the right side.

The Bronchoscopic Report: There was found a moderate inflammatory reaction involving the mucosa of the trachea and bronchi. There was a curious tendency for the right bronchus to collapse during forced expiration and cough. This was not entirely passive. A small amount of secretion was found present. In the left bronchus there was a rounded, smooth, globular growth, attached by a broad pedicle to the spur marking the giving off of the left upper lobe bronchus. The growth partially occluded both upper and lower lobe bronchi. A part of the growth was removed and submitted to the laboratory for histological examination.

The report was adenoma. Previously it would have been called adeno-carcinoma, but experience of the last five years has proven that these

growths are not actively malignant, and that mechanical removal usually cures the patient, even though it must be repeated once or twice.

Removal of the growth by means of the tissue forceps relieved the symptoms in this case.

I should like to present some of the bronchoscopic observations of Chevalier Jackson and Chevalier Lawrence Jackson[3] on post-operative pulmonary complications.

"The term pneumonia is so loosely applied that the term 'post-operative pneumonia' in the history means nothing definite. It might have been an infarct, but probably in most cases it was some form of bronchial obstruction, with or without atelectasis, with or without drowned lung. A new era is dawning now that roentgen-ray examination at the bedside and early objective examination with the bronchoscope are being used to assist in diagnosis.

"Post-operative Atelectasis (Figure 1)—In these cases, formerly mistaken for post-operative pneumonia, there is at the onset a thick, tenacious, obstructive secretion that at first contains grossly no pus and on microscopical examination only a few pus cells and few if any pyogenic bacteria. If not quickly terminated by restoration of ventilation and drainage with consequent re-establishment of the defensive powers of the lung, the atelectasis is slowly succeeded by suppuration, first in the form of drowned lung, then purulent bronchitis, and later abscess, and possibly bronchiectasis. If, on the other hand, early bronchoscopic drainage promptly restores ventilation and drainage, as it usually does, there is no tendency to the formation of a localized purulent collection. We rarely, in these cases, see anything remotely resembling an abscess cavity, with fluid level such as is regularly seen in suppurative complication following tonsillectomy and operations on the upper air passages. The pathological products in atelectasis are largely, if not altogether, endobronchial.

"These clinical facts, now well established by bronchoscopical observations, clearly prove that post-operative atelectasis is not suppurative at the onset. Moreover, these observations indicate that primarily it is not even an infective process.

"Pulmonary Suppuration Following Operations on the Upper Air Passages—Typical examples of this complication are most frequently seen after tonsillectomy, but the same clinical features characterize the disease when it follows other operations about the upper air passages. These clinical features are essentially different from those of pulmonary complications, especially atelectasis, following abdominal operations, and totally different from those following the inspiration of foreign bodies at operation on the upper air passages.

"In a typical case of pulmonary complication following tonsillectomy or other operation about the upper air passages, the patient is taken suddenly ill with prostration, high fever and chilliness, within a week or ten days after operation. Among the initial symptoms there is expectoration of a rather large quantity of foul, usually bloody pus, the patient's breath is fetid, and a roentgenogram at this stage always shows a localized inflammatory area and usually a cavity with a fluid level. If such a level is not at once apparent, it soon becomes recognizable; if bronchoscopical aspiration be done, the cavity is seen to be evacuated, and a fluid level is seen later as it refills."

Bronchiectasis is a disease of the tracheo-bronchial tree, the essential pathology of which is a dilatation of the bronchi. This dilatation may be a uniform enlargement of the calibre of the branch bronchi, called the fusiform type, or it may be the saccular type with localized dilatations. In some cases it seems that a congenital weakness of the walls must play a part in the etiology. The rest of the etiology is connected with infection. Recurrent attacks of tracheo-bronchitis, the infectious type of bronchial asthma, chronic sinusitis (although some insist that the sinusitis is the result, not the cause, due to the constant spraying of infected material up into the nose during cough), the infection following unrelieved obstructive atelectasis and drowned lung, and the infection accompanying the long sojourn of a foreign body.

The merging from the chronic tracheo-bronchitis and the bronchial asthma into bronchiectasis is imperceptible. The expectoration gradually becomes more profuse, and slowly becomes more and more fetid. The patient begins to run afternoon fever, to show clubbing of the fingers, eventually some grade of cyanosis, loss of weight, and cachexia. In numberless instances the diagnosis of tuberculosis is made, and the patient sent to a sanatorium, frequently to contract tuberculosis. All of this usually takes quite a space of time, and the end stages may not be attained.

I quote again from Chevalier Jackson.[4]

"The Bronchiectatic Septic Tank—Bronchoscopic observations indicate that (a) the purulent secretions when first produced in bronchiectatic bronchi are very thick and of such great viscosity that they cannot be expelled under existing im-

paired conditions of expulsion; (b) Nature's way of aiding expulsion is by breaking up the viscid secretions into more fluid and easily expelled secretions; (c) this change in the character of the secretions is brought about by bacterial activities, chiefly saprophytic, but other agencies may contribute; (d) the products and by-products of these changes are intensely irritating to the bronchial walls, and are one of the factors in the changes in those walls as well as in the perpetuation of the disease. Though this use of the tracheobronchial tree as a septic tank for alteration of the character of the contents may enable the individual ultimately to get rid of the pus by lessening its viscosity, the resultant structural changes in the bronchial walls and especially the destruction of the cilia constitute an awful price to pay for riddance of pus. Like Nature's amputations there is room for great improvement in remedial processes. By way of contrast it may be parenthetically stated here that by bronchoscopic aspiration we get up this freshly generated thick pus of high viscosity without waiting for it to get a lower degree of viscosity by rotting. We may then say that one of the results of bronchoscopic studies has been to demonstrate the existence of the bronchiectatic septic tank, and one of the achievements of bronchoscopic aspiration has been to eliminate it.

"Bronchoscopic aspiration is supplemented by the 'tussive squeeze.' That is the compression of the lung during cough squeezes the pus out of the parenchyma and smallest bronchi to within reach of the aspirating tube.

"For satisfactory bacteriologic study as well as for the preparation of the most useful vaccines, it is essential for the bronchoscopist first to clean out the bronchial septic tank and then to obtain, in a separate collector, the residual pus, usually in small amount, directly from the suppurative focus.

"Bronchoscopic Prophylaxis — An enormous field of service to medical science and humanity lies in the bronchoscopic prophylaxis of those common and extensive pulmonary pathologic changes that shorten as well as render miserable the lives of so many human beings. Bronchoscopic aspiration, if instituted early, restores the defensive powers of the lungs by (a) taking the load off the overwhelmed cilia; (b) restoring ventilation and drainage; (c) forestalling stagnation; (d) by early discovery and removal of bronchial obstruction. By arresting suppuration in the acute or the subacute stage, bronchoscopic aspirations will prevent the development of bronchitis, bronchiectasis, the bronchiectatic septic tank, fibrosis, adhesions, and other extensive structural changes in the lung that, once established, are the largest factor in perpetuation of chronic suppuration and its sequelae."

There is another ray of hope in the picture, offered by the surgeon. Bronchiectasis, strictly localized to one side, and preferably to the lower lobe, seems to respond to the collapse therapy of phrenicoexeresis, thoracoplasty, or to both. Lobectomy the technic of which is rapidly being perfected, appears to offer a means of complete eradication. Artificial pneumothorax will not suffice, as the condition is permanent, so must remedy be permanent.

To illustrate bronchiectasis from foreign body may I tell you of a little seven-year-old boy who came in once every two or three weeks for aspiration. He was emaciated; his color was ashen; his fingers were clubbed. An occasional cough was suppressed to a gurgle. At the age of three this boy had a rather large nail in his mouth. He coughed, choked slightly, and the nail disappeared. He coughed no more, but told his parents he had swallowed a nail. A physician was consulted, but as the patient was not coughing, and his respirations were not embarrassed at the time, *he* told the parents to forget about it. After a period of months the boy began to cough up foul pus, and had several sieges of what was called pneumonia. Then the tag of tuberculosis was hung upon him. Three years later he was brought to the bronchoscopic clinic, and after roentgen examination, a large sized nail was removed from the bronchus. However, the picture is hopeless, for the disease has progressed too far, and it is just a matter of time till an infection carries him off. He is just a sac of pus, so full that we had to keep him in the upright position till just the second of the introduction of the bronchoscope to keep him from a horrible paroxysm of coughing with the production of a pint of terribly foul pus.

Figure 2 shows the iodized oil film in an

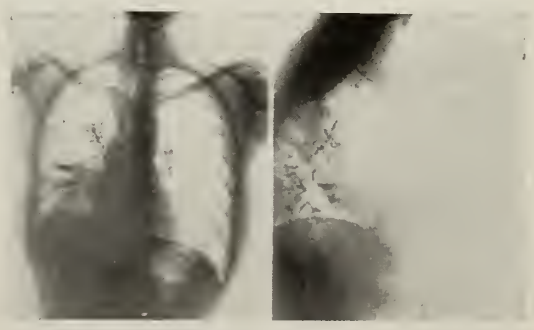


FIGURE 2
Saccular type of bronchiectasis.

extensive lower lobe bronchiectasis, saccular in type, following an obstructive atelectasis which ensued after an extensive pelvic operation for endometriosis. The lateral view definitely places the lesion in the lower lobe. The next slide (omitted from the illustrations) shows the picture following operation on the phrenic and repeated bronchoscopic drainage. The clinical improvement was amazing, the patient gaining weight, strength and her cough and expectoration being markedly reduced.

Figure 3 shows extensive bi-lateral lower lobe



FIGURE 3
Fusiform type of bronchiectasis, bi-lateral in this case.

bronchiectasis of the fusiform type in a young woman about 22 years of age. There is no hope for cure, but the palliative effect of regular bronchoscopy is so great that she appears weekly for treatment.

With reference to lung abscess, Clerf, Flick, Farrell and Funk[5] feel that the ability of the bronchoscopist to inspect the interior of the larger bronchi and the orifices of the bronchial subdivisions renders bronchoscopy a valuable aid in diagnosis. The accurate localization of a suppurative process occasionally presents difficulties. The bronchoscopist can definitely ascertain whether pus comes from one or the other bronchus, and in this way help localize the lesion.

The importance of a diagnostic bronchoscopy in all cases of pulmonary abscess, unless distinctly contraindicated, irrespective of the method of treatment to be employed has been repeatedly demonstrated. Abscess of the lung may be secondary to a neoplasm of the bronchus or an overlooked nonopaque foreign body. In either of these conditions, external drainage would be of questionable value. Bronchoscopy can positively establish the presence of bronchial obstruction and in the case of new growth a specimen of tissue can be removed for histologic examination. If the lesion is benign, it can be removed bronchoscopically; if a foreign body is present, its removal will achieve cure in practically every case.

Bronchoscopic aspiration, in trained hands, can be safely and quickly carried out, and, in properly selected cases of pulmonary abscess, it is one of the most efficient methods of treatment at our command. This drainage is accomplished by the removal of obstructing masses of granulation tissue, and by aspiration of the large quantity of pus which overtaxes ciliary activity in the smaller bronchi.

Depending on the location and size of the abscess, it is given a reasonable trial with weekly or twice weekly bronchoscopic aspirations, complete bed rest, high caloric diet, postural drainage three or four times daily, and a course of neoarsphenamine if spirochetes are found in the aspirated pus. Clerf obtained recovery in 70% of those cases in which the above outlined treatment was instituted within three months after onset.

Figure 4 shows the picture and course of a

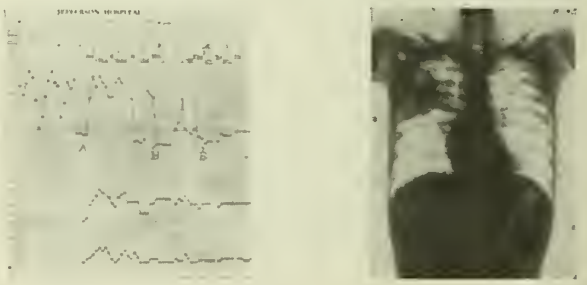


FIGURE 4
Early lung abscess following general tonsillectomy accompanied by the clinical chart which shows rapid recovery following two bronchoscopic aspirations. (A) Entrance to hospital. (B and C) On the two bronchoscopic aspirations.

12-year-old boy who suffered a chill, started running a septic fever, and coughed up fetid material about a week after general tonsillectomy. The temperature record previous to A is copied from the chart of the referring hospital. After two bronchoscopic aspirations at B and C the patient went on to uneventful recovery.

Figure 5 shows the results obtained from September, 1933, on the left, to February, 1934, on the right, by the above outlined treatment. The patient is 32 years old, and the general tonsillectomy was performed the last day of July, 1933.

Figure 6 shows an extensive, peripheral, lower left lobe lung abscess in a 15-year-old boy who

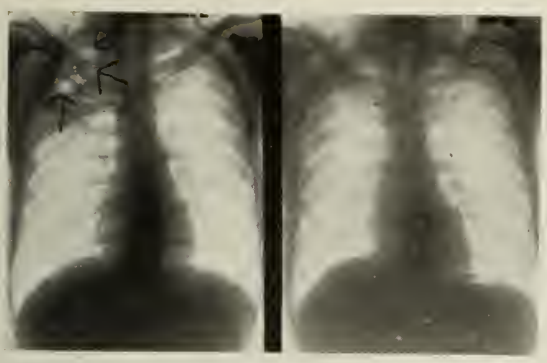


FIGURE 5

Extensive upper right lobe abscess following general tonsillectomy, accompanied by the picture showing recovery after six months' treatment with bronchoscopic aspirations and supportive measures.

had languished in a state tuberculosis sanatorium for two and a half years, until his condition was recognized by my immediate predecessor as second assistant to Dr. Clerf, and sent in for treatment. After diagnostic bronchoscopy he was immediately turned over to Dr. Flick, operated upon the day after I left Philadelphia, and discharged from the hospital one month later, well.

Jackson[6] states that the only means of making an early diagnosis of endobronchial growths is by bronchoscopy. If benign, bronchoscopic removal is efficacious. If malignant, the time is rapidly coming when lobectomy will effect the safe and complete removal of bronchogenic tumors.

Off-hand, one would say that foreign bodies in the tracheo-bronchial tree are obvious. But experience has proven otherwise. When one considers the ease of aspiration, and the long, practically symptomless latent period, it becomes more apparent. McRae[7] states that the presence of foreign bodies in the bronchi is certainly much



FIGURE 6

Extensive lower lobe lung abscess which went unrecognized as to etiology in a state hospital for tuberculous patients for two and one-half years. Recovery followed surgery.

more common than is generally recognized. The increase in the number of cases recognized in a community, as more attention is directed to the condition, is parallel to the increase in the number of cases of pernicious anemia in a district which results from better knowledge of the disease.

Jackson[2] states that the records indicate that in all cases of atelectasis in children, a foreign body should be thought of as the first diagnostic possibility to be excluded.

Figure 7 shows the condition of a 48-year-old



FIGURE 7

Lung abscess and bronchiectasis following the long sojourn of an unrecognized foreign body, a fish bone, in the bronchial tree. Also a film showing the improvement a month and a half following removal and several bronchoscopic aspirations, and supportive treatment.

Jewish osteopath. With a progressive, purulent disease of the lungs, he was first condemned as tuberculous, then the abscess depicted was visualized, and he was sent in for diagnostic bronchoscopy. A fishbone, for the presence of which he could not account, was removed from the left bronchus. Removal was followed by the regular lung abscess regime, and the improvement after a month and a half is shown on the right. He still comes in every two or three weeks for treatment, as a residual bronchiectasis remains.

May I offer four very practical suggestions, outstanding from the time spent in Philadelphia. In cases of laryngeal dyspnea in small children, do a tracheotomy when supra-and infra-sternal indrawing show obstruction, and restlessness shows the lack of sufficient oxygen. Do not wait for cyanosis, for it does not come. Only a peculiar ashen color sets in, and that just shortly before the heart stops beating from exhaustion. When doing the tracheotomy, do it low, practically down in the supra-sternal notch, to avoid injury to the laryngeal cartilages.

With foreign body in the trachea, do not turn the patient upside down and try to shake it out. The chances are that it will catch in the subglottic region, the most constricted of the upper airway, and cause asphyxiation.

(Continued on Page 710)

Sudden Death*

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CLINICAL death, although never accurately understood, has a very definite meaning for physicians. The fact that we might experience some difficulty in evolving a comprehensive and exact definition of just what constitutes death, does not in the least dull the vivid picture each and every one of us has of the end, which is after all "the only certain thing in life."

The mechanism whereby death occurs is not at all clearly understood. The same lethal agent hardly affects any two people in the same way. For example, the shock experienced by a supposedly healthy woman on hearing of a serious accident sustained by her husband, was sufficient to cause her sudden death, while the husband, though badly injured and the victim of profuse hemorrhage, eventually fully recovered and is now living and well. Appoplexy is assigned as the cause of sudden death probably more often than any other natural entity. It certainly does not always kill; moreover, the pathologist is most non-committal in these (and many other) cases when asked just what the cause of death was and how the forces acted in producing it. It is not at all unusual to read in the daily press of the unexpected death of some prominent person, either on the golf links or while transacting business affairs, or of one found dead in bed or while asleep in a berth on a train, and to note that "natural causes," or "heart trouble," or "appoplexy" or some other presumable and plausible ailment is given as the offending agent by the coroner.

Unfortunately, only rarely is an autopsy performed in such instances and although very often such an investigation fails to give us direct clues, still we can only hope to come nearer the solution of the true mechanism responsible for sudden death by studying in painstaking fashion as many such cases as possible.

For the past four years I have been interested in the study of case histories and autopsy findings of individuals who have died suddenly. By sudden death, in this discussion, is meant death occuring in a few seconds or minutes. I have considered for the most part, persons who have been sick and who have died suddenly or unexpectedly. I have not considered cases of death by accident, suicide or surgical complications.

*Acknowledgment is hereby made of the sincere and painstaking efforts of Mrs. Fannie K. Senior, in collecting much valuable data, and assisting with many details of the manuscript.

Experimental Investigations

It is not always a simple matter to reproduce the picture of sudden death in laboratory animals. The phenomena may be vividly observed, however, by injecting three to five cubic centimeters of air into the ear vein of a rabbit. Within a very few minutes the rabbit drops over, exerts a few clonic contractions of the diaphragm, stiffens and can not be revived. Autopsy performed at once reveals quantities of air in the right auricle and in the region of the vital centers at the base of the brain.

In 1913 Kramer[1] demonstrated in a very striking manner why a certain percentage of children stricken with meningococic meningitis died suddenly during or just following the injection of curative serum. He conclusively proved that tricresol, in the percentage strength used as a preservative in meningitic serum, could precipitate respiratory paralysis and death in dogs. If in the injection of serum in humans the needle should injure the filum terminale and make an artificial opening into the central canal (should that passage exist) and thus deliver the highly toxic material directly to the fourth ventricle, death likewise may result and quite suddenly. As a result of this discovery, the use of tricresol as a preservative in all sera used for intraspinal injections has been interdicted.

It is noteworthy that fat embolism, spoken of for many years as a possible cause of sudden issue following severe fractures, has recently been the subject of much interesting investigation. Carrara,[2] as early as 1898, reported fat embolism present at necropsy in 22 per cent of deaths from cardio-vascular-renal disease. Catsaras[3] found fat emboli in the lungs in 18 of 67 cases of post-influenzal pneumonias. That fatal fat embolism does occur without trauma has been definitely proven by Lehman and his associates. They showed that various fat solvents, notably ether, when taken into the body by any route, causes the untra-microscopic fat droplets, always in the blood, to coalesce and form globules of sufficient size to obstruct capillaries. It is for this reason

that ether anesthesia is more dangerous when given after a heavy meal. The practice of starvation for twelve hours before giving a general anesthesia reduces this risk to a minimum.

Dr. Louis Herrmann and his associates, in the laboratory of surgical research of our medical college, have added facts of intense interest to this subject. Among other things, they studied the effect of various organic and inorganic substances upon fat globules which lodge in the capillaries of the lungs after the intravenous injection of a known quantity of sterile fat from an animal of the same species. It was finally demonstrated that all of the pre-agonal symptoms produced by fat thus introduced could be offset or eliminated and certain death prevented by the injection of a dextrose-alcohol mixture (7:3). The lungs of animals thus treated were almost free from intravascular fat. All of the capillaries of the lungs of the control animals contained large amounts of fat. The solution is now in use clinically in the accident room of the Cincinnati General Hospital for patients who have sustained serious trauma, or who are in shock. The results have not been published as yet. Herrmann believes death is probably due to a neurogenic type of reflex.

Syphilis

Undoubtedly syphilis in its latent stages is responsible for many unexpected deaths. If one accepts Warthin's[6] opinion based on a careful study of eight cases of sudden death, certainly many pathologists are missing the actual causative factors in a large number of patients who die suddenly. In explanation of his radical ideas termed by some, "the newer pathology of lues," Warthin[7] stated that the gumma was no longer the criterion for the diagnosis of syphilis, but that milder, more diffuse, specific inflammatory processes occurred which eventually lead to fibrosis. Based upon his work, he estimated that about 30 per cent of the population was syphilitic. Clawson and Bell[8] and other observers, attempting to verify Warthin's observations, met with failure.

A most important contribution to this subject came from the pen of Harrison S. Martland,[9] chief medical examiner of Essex County, New Jersey. In reviewing 8,667 sudden deaths from all causes over a five-year period, he made a painstaking analysis of 300 sudden deaths due to heart disease which were autopsied. He found syphilis of the aorta and heart in 101 cases, aortic regurgitation, stenosis and atresia of the coronary ostia in all except 12 of the remaining cases. In aortic regurgitation he believes that sudden death is clearly explained by the extensive hypertrophy and dilitation of the left ventricle. The mechanism of death production in coronary atresia (due to encroachment by the syphilitic process over the coronary orifices) he found difficult to explain, since the myocardium was usually normal and the heart frequently small.

The Emotions as Factors

Recently attention has been called to the importance of the emotions, of excitement, fright, worry, etc., in cases of heart disease, dying suddenly. Neurologists with whom I discussed this subject are inclined to the idea that all dramatic sudden deaths where gross pathology is insufficient to explain the outcome, are undoubtedly medullary in origin. Exactly what takes place in these higher centers under such circumstances, is difficult to explain. Lately some additional light has been shed on this subject in the study of a few sudden deaths occurring while the persons were driving automobiles. Such deaths apparently have occurred more frequently in the past few years.

Lecount and Rukstinat[10] report three cases of sudden death while motoring. In each instance the individual was either apparently in good health, the end coming with "explosive violence," or the abrupt termination occurred in a person partially ill, but engaged in an occupation in which he was able to continue in spite of latent disease. In one of the cases an automobile driven at moderate speed was observed by those in a following machine to zig-zag, leave the road, and turn over in a shallow ditch. The driver, a man aged 67, crawled out from the overturned car, stood for a few minutes by it, and then fell over dead. His death certificate was assigned skull fracture as the cause of death. Exhumed by court order, autopsy revealed extensive fibrous myocarditis with a small unruptured aneurysm of the wall of the left ventricle. The heart was considerably enlarged. The train of events in this case must have been of an acute nature. While the man was driving the cessation of circulation to the brain interferred with his management of the car. The heart action finally ceased after the man got out and stood up by the overturned machine. No injury to the skull was found at autopsy.

In a previous article Lecount[11] discussed other cases of sudden death. He states that first, fibrous myocarditis is accountable for the largest number of unexplained sudden deaths (such persons often die in bed at night, sitting upright in a chair, or in the seat of some public conveyance, and so quietly

that frequently others near by are unaware that death has occurred); second, acute coronary obstruction, which Lecount found (substantiated by others) kills a decade or more earlier than fibrous myocarditis. These were all associated with latent syphilis. A point of great clinical interest lies in the observation that none of these cases, even though anginal symptoms had been present, had ever expressed a feeling of impending death. Undoubtedly many deaths occurring while motoring, or under exciting circumstances (coitus, anger, fright) are on the bases of fibrous myocarditis. It is noteworthy that many such patients have previously enjoyed health or have had only mild digestive disorders. In a few instances, gall stones have been suspected. Of interest also is the fact that those causes of death more commonly advanced and accepted, such as ruptured aneurysm, cerebral hemorrhage, pulmonary embolism, etc., are found so infrequently at post mortem examinations.

Personal Observations

Until such time as autopsies are required on all patients, dying under unusual circumstances, our knowledge of the causes of sudden deaths will progress slowly. Our prognostic skill will suffer likewise, for the difficulty of co-ordinating what are considered at times trivial clinical signs with eventualities, remains unmitigated. In their laudable efforts to be sympathetic and helpful to the bereft family, physicians are inclined to sign death certificates indifferent as to what might be the actual facts. Then, too, sudden deaths occur occasionally under such unusual and embarrassing circumstances, and in such out of the way places and situations, as to render post mortem proceedings awkward and unfeasible. Because of these rather insuperable difficulties it was decided after long consideration, to study deaths occurring suddenly in patients afflicted with a variety of illnesses. The present report covers a series observed in the Cincinnati General Hospital and Jewish Hospital, during the year 1932. At least in this manner some data concerning the events leading up to the final scene are appraised and in the majority of instances, autopsies have been performed.

Sudden cessation of all bodily functions occurs, as I see it, under one or more of the following categories:

TABLE I

1. *Circulatory System.*
   - (a) *Hemorrhage.* (Ruptured aneurysm of myocardium, etc.)
   - (b) *Thrombosis.*
     1. Coronary.
     2. Cerebral.
     3. Mesenteric and others.
   - (c) *Embolism.*
     1. Fat—air.
     2. Pulmonary.
     3. Coronary.
     4. Cerebral.
   - (d) *Arrhythmias.*
     1. Ventricular fibrillation.
     2. Stokes Adams disease.
   - (e) *Arterial Spasm (?).*
     1. Angina pectoris (?).
   - (f) *Constitutional.*
     1. Hemophilia.
     2. Purpurae.
     3. Obesity.
   - (g) *Toxic.*
     1. During severe infectious diseases (diphtheria).
   - (h) *Latent Syphilis.*
2. *Respiratory System.*
   Laryngeal and tracheal obstruction.
   1. Polypi.
   2. Acute pulmonary oedema.
   3. Suffocation and strangulation.
   4. Recurrent laryngeal paralysis.
3. *Central Nervous System.*
   - (a) *Organic Disease.*
     1. Epilepsy and other convulsions.
     2. Brain tumor (hemorrhage).
   - (b) *Constitutional.*
     1. Status lymphaticus (?).
     2. Anaphylaxis.
   - (c) *Shock.*
     1. Surgical trauma (including all "punctures").
     2. Emotional (?) (fear, anxiety, etc.).
   - (d) *Mechanical.*
     1. Heat stroke.
     2. Electricity.
   - (e) *Toxic.*
     1. Snake bites and others.
     2. Chemicals (tricresol) and others affecting vital centers.
4. *Accidents and Trauma.*

It is a relatively simple matter to set up this kind of a classification, into which one hopes to fit the individual cases as they appear. Actually, and in practice, many difficulties present themselves. Mention has been made in a previous paragraph of that large and impressive group of cases where it is impossible to determine the cause of sudden death, even when the tissues are given the most careful scrutiny. More will be said on this subject in a subsequent report. Then there

is still a larger series, as a matter of fact, the largest of all, where death is due *to the failure of not one organ or system,* but to more than one. My interest was first attracted to a patient illustrating this point. A retired banker of 65 years of age, consulted me four years ago, thinking, because of frequent urination and exhaustion, that he had cardio-renal disease. On physical examination he proved to be an excellently preserved man, who had an enormous prostate, the cause of all of his disability. He went through a two-stage prostatectomy, and his convalescence was uneventful. He had been up and about in the hospital for ten days. On the date set for his departure from the hospital, while walking to the bathroom, he fell to the floor, gasped once or twice, and died. The post mortem findings were of great interest. A small patch of fibrous myocarditis, representing an old infarct, and a moderately enlarged heart were found but of greater importance, a recently thrombosed posterior cerebral artery was present. The arterial tree was otherwise not remarkable, likewise the other organs. More than one system was responsible for death. The mechanism of its sudden origin is difficult to explain, in all probability was medullary in nature.

There were fifty patients who died unexpectedly in the wards of the two hospitals already referred to, during the year 1932, under conditions rendering them eligible for this study (Chart I). Of these, 17 came to autopsy, thus enhancing their value for the purpose of this report.

(Chart 2) Clinically the cases fall into the following groups:

	Average Age
1. Myocardial fibrosis (and arteriosclerosis)	56
2. Coronary thrombosis, acute or chronic	59
3. Syphilis or myocardium and aorta	42
4. Cerebral accidents	55
5. Pulmonary embolus	
6. Catarrhal jaundice	
7. Miscellaneous	
8. Hypertensive heart disease	

Let us compare this group with the results of the 17 cases which were studied anatomically. (Chart 2.)

TABLE II

Case	*Age*	*Clinical Diagnosis*	*Anatomical Diagnosis*
B1095	54	Cerebral embolism.	Expired suddenly.
4698*	71	Cerebral accident.	Died in bath tub.
612	50	Cerebral accident.	Collapsed on floor.
1373	72	Cerebral accident.	In wheel chair after operation. Died on return to bed.
6755	43	Cerebral hemorrhage.	Died in sudden convulsion.
1242	36	Cerebral thrombosis.	Died in sudden tonic convulsion.
9046*	60	Cerebral embolism.	Allowed up. Died on return to bed. Sudden.
6986	56	Myocardial fibrosis.	Suddenly ceased to breathe.
12615*	29	Myocardial degeneration.	Died while being weighed.
14640	36	Chronic myocarditis.	Died in sudden convulsion.
B2660	69	Myocarditis.	Died in sudden cardiac collapse.
B1004	65	Myocardial degeneration.	Making good recovery from operation. Died suddenly.
B587	38	Myocardial degeneration.	Died suddenly after seeing visitors.
5800	61	Arteriosclerotic heart disease.	Died on way to X-ray.
5734*	69	Arteriosclerotic heart disease.	Suddenly expired.
12928*	57	Arteriosclerotic heart disease.	Died unexpectedly.
10142	58	Arteriosclerotic heart disease.	Heart changed rate. Died suddenly.
14946*	75	Arteriosclerotic heart disease.	Fell out of chair. Dead.
1394	36	Arteriosclerotic heart disease.	Death sudden. In sleep.
190	22	Hypertensive heart disease.	Found dead in bed.
6413	60	Hypertensive and arteriosclerotic heart disease.	Died in sleep.
5906	63	Hypertensive and arteriosclerotic heart disease.	Died while washing herself.
14590	60	Coronary thrombosis.	Found dead in bed.
B1112	64	Coronary thrombosis.	Ready to be discharged. Found dead.
B3895	60	Coronary thrombosis.	Died in sudden collapse.
12711	50	Possible coronary sclerosis.	Died while getting on bed pan.
8720*	51	Coronary sclerosis.	Rolled off bed. Died on floor.
2206	46	Coronary occlusion.	Died while talking to other patients.
7302	64	Coronary occlusion.	Fell off the bed and died on the floor.

11299	80	Coronary occlusion.	Died while getting off street car.
10517*	39	Syphilis, thyroidectomy.	Died suddenly.
7654*	35	Luetic heart disease.	Died unexpectedly.
11650	41	Luetic heart disease.	Died suddenly.
13291	31	Luetic heart disease.	Died unexpectedly.
15030	47	Luetic heart disease.	Died unexpectedly.
10433*	50	Luetic aortitis.	Died unexpectedly.
11091*	55	Luetic heart disease.	Died suddenly.
7687	50	Luetic heart disease.	Died in sleep.
1627	44	Lues, aortic insufficiency.	Died in sleep.
6735	30	Aortic aneurysm.	Died on operating table.
1929	41	Arteriosclerotic heart disease.	Fell out of chair. Died on floor.
9883	70	(?) Suprapubic cystostomy.	Died unexpectedly.
4143	70	Arteriosclerotic heart disease.	Died on bed pan.
11297	42	Auricular fibrillation.	Died suddenly.
11322	33	Ischiorectal abscess.	Died suddenly. Had had minor operation.
10939	35	Rheumatic heart disease (?).	Talking 15 minutes before sudden death.
5000*	24	Pulmonary embolus.	Patient normal after operation. Sudden death.
13486*	62	Catarrhal jaundice.	Dead before interne arrived.
B2190	29	Shock.	Died on operating table.
B2952*	30	Congenital heart disease.	Died while getting back rub.
8720	51	Coronary sclerosis.	Coronary sclerosis.
7302	64	Coronary occlusion.	Atherosclerosis coronary arteries.
5906	63	Art. scl. heart disease.	Arteriosclerosis. Myocardial fibrosis.
5734	69	Art. scl. heart disease.	Cause of death not determined.
12928	57	Art. scl. heart disease.	Arterionephrosclerosis. Syphilitic aortitis.
14946	75	Art. scl. heart disease.	Coronary sclerosis.
10433	50	Hyp. heart disease mitral stenosis.	Luetic aortitis. Aneurysm aorta.
10517	39	Thyroid heart disease syphilis.	Two syphilitic aneurysms of aorta.
7654	35	Luetic heart disease with aortitis.	Luetic aortitis.
11091	55	Luetic heart disease with aortitis.	Luetic aortitis. Auricular thrombus.
12615	29	Myocardial degeneration.	Cause of death not determined.
9046	60	Cerebral embolism.	Atherosclerosis coronary arteries and cerebral.
4698	71	Cerebral accident.	Areas of cerebral softening.
5000	24	Abscess lactating breast.	Pulmonary embolism.
13486	62	Catarrhal jaundice.	Ac. diffuse hepatitis. Pulmonary infarction.
B2660	69	Cholelithiasis, myocarditis.	Coronary sclerosis. Atheroma of the aorta.
B2952	30	Congenital heart disease.	Cong. heart disease. Tricuspid insufficiency. Dilatation of right auricle and ventricle.

Here again latent syphilis and coronary circulatory disturbances claim the largest number of victims. Of interest is the anatomical diagnosis in those cases, clinically diagnosed as having "arteriosclerotic heart disease," a diagnosis which is non-informative, unintelligently applied, and should be eliminated from modern nomenclature. Pathologists have repeatedly shown that the heart in old people who have generalized arteriosclerosis is more often smaller than one would expect the heart to be, and that where there is no interference with the coronary circulation, the cardiac system is apt to be normal. Instead of applying this term loosely to a failing heart in advanced life, it should be remembered that either a fibrous myocarditis, or damage to the coronary circulation are nearly always responsible for this condition of the failing heart which of itself is simply an expression of impending dissolution.

Electrocardiographic Findings

In twenty-three of the cases on whom electrocardiograms had been taken at some time during their stay in the hospital, it is of more than passing interest to note the most unusual of the electrocardiograms obtained. I have again grouped these findings in the categories in which they naturally fall.

1. *Luetic Heart Disease.*

The 5 cases on whom tracings were made showed the following defects:

(a) Low voltage (2 or more leads—5 mm. or less.)

(b) The R T waves were in every instance of low voltage, in lead 2 or in leads 2 and 3.

(c) Bundle branch block. Present in two cases.

(d) Abnormal ventricular waves. Abnormal widening of QRS complexes, or notching in four instances.

2. *Myocardial Fibrosis.*

There were four electrocardiograms taken and studied on patients who died under this classification.

(a) Low voltage. Three cases showed this very prominently.

(b) R T complexes in three instances were notched in lead 2 and leads 2 and 3.

(c) Bundle branch block. This was present in 2 instances and aborization block in one.

(d) Abnormal ventricular waves. Present in two cases. Abnormal widening of the QRS complexes, or notching in four instances.

3. *Coronary Occlusion.*

Only two patients who showed coronary occlusion, recent or of long standing had electrocardiograms.

It is noteworthy that the classical changes described by Pardee and others commonly associated with this disease were absent in each instance. In one case auricular fibrillation was present and in the second a slightly delayed QR interval.

4. *Deaths Due to Unknown Causes.*

It is interesting that the three deaths thus classified should have been so baffling in the hands of the pathologist. In each instance, clinically, there were striking changes which ordinarily are considered typical of advanced heart disease. In one case the Q-R S was notched in all leads, and there was an intra-ventricular heart block. In two cases there were partial heart blocks with low voltage T waves in all leads, and in the third case auricular fibrillation with varying degrees of heart block.

5. *Catarrhal Jaundice.*

I mention this case in particular since it represents a clinical entity of importance where one is considering circulatory disturbances. In one case of catarrhal jaundice the patient was not considered seriously ill, but died while sitting up in bed. The electrocardiographic changes were those associated with partial heart block, low voltage, and ventricular complexes in all leads. Heart and pulse rate were 50. This is the third case of sudden death that I have observed occurring in the course of acute catarrhal jaundice.

It is a matter of common knowledge that jaundice has as one of its symptoms, varying degrees of Bradycardia. Another important symptom is that of extreme exhaustion. I am convinced that the effect of large quantities of bile circulating in the blood occasionally cause acute cardiac depression, and as is true in this case, occasionally even myocardial damage. The autopsy findings in this case were acute diffuse hepatitis, flabby myocardium, and recent pulmonary infarct. While sudden death is usually not associated with this disease, I believe greater consideration should be given in the management of these patients during the early stages of jaundice. During this time patients should be kept absolutely at rest.

Summary

It will, of course, be observed that the cases considered in this analysis have been deaths in patients who have been victims of some type of heart disease. This, however, happened by chance, since every case of sudden death in a nine hundred-bed hospital, and also those occurring in a small private hospital have been considered. The only ones which have been deleted were those few who died accidental deaths, and the still smaller number to die as a result of surgical shock. So that, it may be definitely stated that sudden and unexpected deaths are in the majority of instances related to some abnormality on the part of the cardio-vascular mechanism. It is quite doubtful that sudden death ever occurs in what is ordinarily called an apparently healthy person. It will be noted by referring to cases reported by Martland, and referred to early in this paper, that the majority of unexplained deaths occurring in individuals occupied in their usual pursuits, have as their bases, either latent syphilitic changes somewhere in the cardio-vascular tree, or fibrous changes in the myocardium, due either to syphilis or to recent or old disturbances in the coronary circulation or to a combination of these causes.

It may logically be asked why there were so few cases of so-called hypertensive heart disease present in this series. I believe that hypertensive heart disease is more commonly found in individuals of a somewhat different social level than those studied. Hypertensive heart disease is not seen quite so often in public hospitals as in private practice. The disease causes invalidism, but rarely kills suddenly. Likewise the incidence of sudden death occurring in the wake of cerebral hemorrhage is very low. This unfortunate accident cripples more often than it kills. The sudden deaths attributed to this cause, I am convinced are exaggerated.

I realize that this discussion has hardly advanced appreciably our understanding of the exact mechanism involved in the sudden cessation of life. It is to be hoped that further study of this problem, which is in process, may advance our

knowledge, but it is a very difficult problem, for as stated previously, the final study involves more than the consideration of what occurred to any one organ or system. It is significant, however, that one finds it difficult to approach any clinical problem without being impressed with the tremendous part which syphilis plays in the eventual deterioration of the more important tissues of the human body, and also what a powerful lethal weapon the spirochete is.

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Bronchoscopy and General Medicine

(Continued from Page 703)

With foreign body in the esophagus, do not give bulky food, or try to dislodge it blindly by instruments, for the esophagus is tissue paper in thinness, and perforation leads almost always to fatal infection traveling down to the mediastinum. Such efforts always make the esophagoscopic removal many times more difficult and dangerous.

I know that many of you consider that bronchoscopy is a traumatic and painful procedure. The best way that I can controvert such an idea is to tell you of the approximately 20 to 25 patients who come in weekly for treatment bronchoscopy. In an ante-room they receive two applications of 10% cocaine to the superior laryngeal nerve in the pyriform sinuses, walk into the operating room, lie down on the table, receive their bronchoscopic treatment, get up and walk from the operating room unassisted, remain in the ante-room for approximately 15 minutes, put on their coats and proceed about their business. I also have a picture of a six-year-old boy walking into the operating room without any pre-medication whatsoever, saying, "Good morning, Doctor Clerf," climbing on the table unassisted, lying down and receiving his treatment bronchoscopy, getting up, turning around, saying, "Thank you, Doctor Clerf," and marching out of the operating room.

In conclusion, Jackson[4] states that the mortality of 43,710 endoscopies by 190 bronchoscopists was less than one-tenth of 1%, and that considering the bronchoscopy apart from the condition for which it was done, there was no mortality. So we believe that every chronic case of pathology of the tracheo-bronchial tree and the lungs, excluding empyema, in which the tubercle bacillus can not be demonstrated, should have at least a diagnostic bronchoscopy. Just as we have, and use freely, speculae for the other body orifices, should we use the bronchoscope.

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An Immunization Clinic*

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SO MUCH proper emphasis has been placed on the prevention of disease during the past score of years that it has fired the imaginations of many well-meaning organizations and has led them to sponsor this or that clinic for the immunization of certain portions of the population against this or that disease. So far as the education propaganda is concerned, there can be no criticism of any group which brings about enlightment of the general public. Any organization doing such work should receive the highest praise. But, when any organization attempts to carry out a program of free immunization for all citizens, regardless of their ability to pay for that service, that organization is going too far and should be rightly criticized.

Immunization is here to stay. Every year brings us nearer to the realization of the dream of the ardent student of preventive medicine—to discover a successful method of preventing every disease. We have come a long way since the days of Jenner. It was over 140 years ago that he gave us the successful method to prevent smallpox, a disease which up to that time caused more deaths than any other which afflicted man. Now we recognize vaccinations or immunizations against many other diseases, such as diphtheria, typhoid fever, scarlet fever, tetanus, pertussis, etc.

Last year a patriotic organization, searching for something tangible to do, decided to rid South Dakota of diphtheria by wholesale immunization of all who would take the shots. A generous biological house donated $1,000 worth of toxoid as a nucleus. The entire relief nursing set-up of the state set about to get the consent of the parents. After the survey had been made, and everyone promised free immunization, it occurred to the organization that it might be well to consider who was going to administer this free service. Knowing the trend of the medical profession to fall in line with every innovation for free medical work, they decided to ask the doctors to do this work for them.

As far as I know, every physician was approached to do this free service. He was supposed to go to the school room or central meeting place, and give the injections to all comers. Many physicians went where they were told, did what they were told, furnished their own equipment and some their own nurse to prepare the patients for immunization. They received for holding the clinic the sum of $5.00, which was paid by the emergency relief set-up of the state.

In visiting the doctors who conducted these clinics, I failed to find a single one who was enthusiastic about it. When I asked them why they went at all, they said they dared not refuse.

The physicians of Lake County, South Dakota, were asked to fall in line. None of them felt that it was the proper way to treat the profession in getting the clinic all organized without consulting them, and then announcing that doctors in other counties were generous and made no objections, and that they hoped Lake County doctors would not be the only ones in the state to object.

The eleven physicians of the county met, and decided to appoint a chairman of the proposed immunization clinic. A letter was written to the organization, stating why we did not feel justified in accepting the set-up as it was presented to us, but that we would agree to the immunization of all who came to our offices for that purpose, and that free immunization would be given to those who were not able to pay for the service. We considered that every patient in the county should have the right to go to the physician of his choice, which would be made possible by the clinics being held simultaneously in the doctors offices. Our proposition was turned down flatly, and it was announced that there would be no immunization in Lake County because the physicians had refused to co-operate in giving the toxoid.

We let the immunization program ride for the time being. About the first of August we had so many requests for immunization against diphtheria that we decided to see what kind of a clinic might be arranged by the physicians themselves. It was found that the State Board of Health would provide toxoid for the free cases, that clinics could be held in each of the doctor's offices, and that each physician would be paid $5.00 for holding the clinic for free cases. This was to be paid out of relief, the same as was done for the physicians who traveled to the schoolhouse or other places to give the immunization clinics.

A little publicity was given to these clinics, and

*Presented before the Third District Medical Society, Brookings, S. D., September 20, 1934.

the dates set. The free clinic was held on Saturday from one to three o'clock, and on Monday at the same hours there was a pay clinic, at which the immunizations were given at a reduced rate. At these clinics, 475 were immunized with toxoid and four hundred were vaccinated against smallpox. There was not a single complaint from any of the children immunized, which is often the case where immunizations are given by someone other than the family physician.

We know that the patients like this kind of a clinic. This was shown very clearly when it was found that one of the physicians had to be away at the time of the clinic, and he put a notice in the paper that he had to be away and that all who wished to wait for him could do so, and that he would arrange his clinic on his return on the same plan. Forty-three of his patients waited for him and were immunized against diphtheria, 14 were also vaccinated against smallpox, so that the total immunized in Lake County from this one effort was 518 against diphtheria and 414 against smallpox, or a total of 932 immunizations.

Dr. P. B. Jenkins, superintendent of the State Board of Health, in a letter written from Pierre on August 31, 1934, makes this statement: "I am well pleased with this method of conducting a county clinic and can see no reason why this method should not be employed in any county where the physicians desire to do so."

The purpose of bringing this report to the Third District Medical Society is to call your attention to a method of putting the brakes on the encroachment which many of the well-meaning service organizations are making on the medical profession.

If there are to be immunization clinics, these are properly given by the physicians in their own offices, not in schoolhouses, city halls or court houses.

The prevention of disease is too important a phase of our profession to delegate to a lay organization. Unless the physicians wake up to the situation, we will find ourselves in very undesirable positions in regard to this phase.

As chairman of the immunization committee of the physicians of Lake County, I recommend:

1. That a careful study of this problem be made during the year.
2. That two or three clinics be arranged during the summer for immunization purposes.
3. That at these clinics should come all who care to be immunized and that no charge be made of persons who are unable to pay.

In this way more people will take advantage of immunization. There will be no stigma of pauperism attached to those who come to the clinic as there is when they come on the free day. There can be a graduated scale so that immunization can be within the reach of all. A pay clinic fee would be established, but the patient would be allowed to pay what he could, and everyone would be happier about it, especially the doctors.

It is my hope that the time will come soon when baby clinics, pre-school clinics, and immunization clinics will be conduted in the offices of the physician rather than in unsuitable places. If so-called baby examiners go about the county holding these clinics, have them make their clinic appointments at the various doctor's offices, and assist him in the examinations. If, perchance, there is something found that the doctor had not discovered, he would be on the job with the follow-up care. Lack of follow-up care is one of the most deplorable situations of the present clinics, in which findings are made but nothing is done about it.

I invite your suggestions and criticism of this plan.

The Use of Dilaudid in Labor Post-Partum and Post-Operative*

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SINCE August, 1932, we have been using dilaudid for obstetrical and gynecological work and at this time are reporting on the results obtained with it in 68 obstetrical and 71 surgical patients. In some of these cases dilaudid was used alone, while in others it was combined with other drugs. Here, we wish to emphasize that a patient in labor must be considered individually and that the indications vary according to the symptoms encountered; no set rule can be followed for the administration of drugs as is possible in post-operative cases.

Our attention was first drawn to dilaudid by the report of W. C. Alvarez,[1] and also the reports from the European clinics where it had been used over several years apparently with marked success in relieving pain. Alvarez compared dilaudid with codeine stating that it was "a better reliever of pain and without effect on the bowel." He advised its use for patients suffering with inoperable cancer. O. J. Menard[2] later reported on several patients with cancer suffering intractable pain. Dilaudid was given orally in doses of grain 1/24, attaining a more effective analgesia, better toleration with fewer undesirable symptoms than with morphine. It happens that our introduction to the use of dilaudid was also in a case of inoperable carcinoma. This patient had been receiving morphine sulphate grain ¼ twice daily as a routine and had reached the stage where an increase of the dose was necessary. At this point we discontinued the morphine and commenced to use dilaudid in rectal suppositories containing 1/32 grain. In about ten days this dose was increased to 1/24 grain and until the patient's death on December 1, 1932 (a period of over three months) the dosage was not increased and at no time was given more frequently than every six hours. The patient claimed that she was relieved of pain, that she was less nauseated than she had been with morphine and had less trouble with her bowels.

For many years we have inserted a suppository containing opium grain i in the rectum at the conclusion of the third stage of labor, especially in cases in which an episiotomy had been performed; this was discontinued and a suppository containing dilaudid grain 1/24 was used. We noticed that patients were more comfortable, had less nausea, less itching than with opium and that there was no tendency toward a delay in emptying the bladder (although orders are always left to catheterize within ten hours post-partum if necessary). In very few cases was it necessary to repeat the suppository for "after pains."

Shortly after we started with the dilaudid suppository in post-partum cases, we began to use it in our post-operative gynecological cases. Our routine at present is to insert a suppository containing dilaudid grain 1/24 in the rectum every six hours during the first forty-eight hours; every eight hours the third day; and in the morning and evening on the fourth day. It is interesting to note that we have had fewer complaints of post-operative "gas pains," nausea and vomiting, that a smaller percentage required the insertion of the rectal tube or enemas for "distention," or the injection of surgical pituitrin. We have found that the use of the dilaudid suppository alone in many cases was not enough to produce sleep and that morphine sulphate grain 1/6 or some form of barbiturate was necessary. In a few cases dilaudid grain 1/32 subcutaneously was used, but we question if that dosage alone will produce sleep as frequently as morphine sulphate grain 1/6 unless one of the barbiturates, such as sodium amytal grain iii or nembutal grains iss, is given with it. In 14 per cent of the cases no drug was used except the dilaudid suppository; 36 per cent required only one injection of morphine sulphate; 40 per cent required two or three injections during the first three days; 10 per cent required four injections or more of morphine sulphate during the first three days to keep them comfortable or produce sleep.

The results obtained with the dilaudid suppository in post-partum and post-operative cases were so gratifying that we began to use it in our pre-natal cases, especially in hyperemesis gravidarum and the toxemias. In the milder cases of hyperemesis it proved satisfactory. It

*Presented before the St. Louis County Medical Society at Duluth, Minn., September 13, 1934.

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was not as effective as the large doses of bromides and chloral in the cases requiring hospitalization but after the second day could be used either alone or alternately. In the toxemias no harmful results were noted, the patients were less anxious, more comfortable and an average lowering of the blood pressure was apparent. In a study recently reported by David[3] on a group of students, to determine the effects of dilaudid and morphine on basal metabolism and other body functions, he concludes that along with the lowering of basal metabolism there is a lowering of body temperature, decrease from the normal in the heart rate and pulse pressure due to less heat production, increased heat loss through dilated cutaneous vessels and through excessive perspiration. Dilaudid acts more rapidly but over a shorter period of time than morphine; slightly less respiratory depression in the normal dose, but a very marked depressant on the respiratory center in the larger doses.

After six months use of dilaudid rectally, postpartum and post-operatively, we decided to give it a trial subcutaneously in the first stage of labor. Ruch[4] has recently reported on a series of 100 cases in which the results obtained closely paralleled ours, as given in the summary, particularly as to the time required to produce analgesia. He used dilaudid grain 1/32 and scopolamine grain 1/130, remarking on the rapidity of action and the comparative freedom from side effects. Brief mention was also made of the use of the 1/24 grain suppository for "after pains." Due to the fact that every parturient woman demands individual care, it is impossible to give a definite routine to be followed in all cases. Keeping in mind that we wish to bring a mother safely through her ordeal with as little pain as possible and at the same time try to insure the delivery of a live baby, we offer the following as a procedure for normal cases: Admission to the hospital as soon as patient is definitely in labor; blood pressure taken; rectal examination followed by abdominal determination of position of baby, and of the rate and position of the fetal heart tones; soapsuds enema; preparation of patient. No drug is to be given until the patient complains of pain, and then give sodium amytal grains iii to vi or nembutal grains iss to iii orally. This is followed by dilaudid grain 1/32, scopolamine hydrobromide grain 1/200 injected subcutaneously in one to three hours, depending on (a) the character of the uterine contractions, (b) the mental attitude of the patient, and (c) the amount of cervical dilatation (two to three centimeters in multiparas and three to four centimeters in primiparas). If necessary repeat the scopolamine 1/200 in one to two hours. In a prolonged labor the dilaudid 1/32 and scopolamine 1/200 may be repeated three to four hours after the first dose. J. B. Jacobs[5] has reported a similar procedure with results quite in accord with ours. We have not found it either necessary or advisable to repeat a third dose of the dilaudid during labor except in one case which had a Bandl's contraction ring. This patient, Mrs. M. P., a primipara, age 26, ten days overdue, was admitted to St. Mary's Hospital on March 12, at 8:30 P. M., when she was examined and prepared in the usual manner. Labor had commenced at 2:00 P. M. At 11:30 P. M. the contractions were about ten minutes apart and rectal examination revealed a vertex presenting high, cervix uteri 80 per cent effaced with three to four centimeters dilatation. Nembutal grains iss was given, followed in one hour with dilaudid 1/32, scopolamine 1/200 since the contractions were becoming much stronger. Two hours later 1/200 grain of scopolamine was given subcutaneously and at that time the contractions were five minutes apart, the patient dozing between pains. During the early morning hours, with the pains ten to fifteen minutes apart, the patient was comfortable. At 8:30 A. M. rectal examination showed a 40 per cent dilatation and no other change, and scopolamine 1/200 was given. At 1:15 P. M. (twenty-four hours after the onset of labor) a 60 per cent dilatation of the cervix was noted and another soapsuds enema was given with little effect; this was followed with nembutal grains iss. At 4:50 P. M. another dose of dilaudid 1/32 and scopolamine 1/200 given; contractions were then four minutes apart. At 8:30 P. M. the cervix was completely effaced and 80 per cent dilated. Pituitrin minums ii was given which stimulated the contractions for forty-five minutes. Patient was sent to the delivery room shortly afterwards, prepared and catheterized. Nitrous oxide anesthesia was started at 10:00 P. M., and at 10:14 the membranes ruptured artificially and manual dilatation started (as the cervix remained only 80 per cent dilated), and afterwards midforceps were applied without results. Elbow gloves were put on with the intention of doing a version and Bandl's contraction ring was definitely made out. The patient was given deep surgical ether anesthesia and adrenalin was given without effect. With our previous experience of trying to break down the ring, generally ending with considerable trauma and a still birth, we decided to send the patient back to bed to await developments as the condition of the mother

and baby were both fairly normal. The patient was given nembutal grains iss and at 2:00 A. M. the usual dose of dilaudid and scopolamine was repeated. At 5:30 A. M. the patient complained of pain in the region of the rectum, was given a high hot soda enema in the knee-chest position. Within twenty minutes we noted bulging of the perineum. The patient was sent to the delivery room, again prepared, and under nitrous oxide anesthesia, low forceps were applied, following a mid-left episiotomy and a living baby girl was delivered at 7:00 A. M. (forty-one hours after the onset of labor), position O. L. A. The contraction ring forced the cord and membrane of the placenta out and it was necessary to manually remove the placenta through the contracting ring, which was accomplished forty minutes later. No pituitrin had been given during the preceding eight hours but after the placenta was expressed Ergot i c.c. was given and the episiotomy repaired, followed with a dilaudid suppository. The post-partum condition of both mother and baby was normal.

As a rule we prefer not to give a narcotic after the dilatation is complete or if labor may terminate within two to four hours after the injection, but in 15 per cent of our series labor did terminate within two hours and there was no sign of asphyxia that could be attributed to the dilaudid. A case of particular interest in this respect was a pre-eclamptic which was given dilaudid grain 1/32 and scopolamine 1/200 twenty minutes before a living baby was delivered by abdominal section. About half the amount of ethylene-oxygen anesthesia was used and no trouble was encountered in controlling the uterine hemorrhage. In most instances delivery was completed with the aid of nitrous oxide-oxygen anesthesia, using the inhalations during the contractions only and during the actual delivery. In versions and occipito-posterior position we prefer ethylene-oxygen or ether.

In the late toxemias of pregnancy, the pre-eclamptic and the actual eclamptic seizure, dilaudid may be given with safety alone, or in conjunction with barbiturates orally, rectally or intravenously. They will give better results with smaller doses in combination than relying upon the larger doses of any one individual drug. The following case is of interest as it shows the use of dilaudid in labor and also post-partum. Mrs. P. B., age 31, primipara, had a normal pregnancy up to the time of going away on a visit when she became careless with her diet. She returned ten days before her delivery showing signs of toxemia with a blood pressure of 158/98, edema and albumin ++. She was placed on a very restricted diet and admitted to Northwestern Hospital on the evening of June 25, the membranes having ruptured on the 22nd, a month ahead of the calculated term. She had no pains until noon of the day of admittance. At 9:20 P. M. pains were about four to five minutes apart. At that time rectal examination showed 40 per cent effacement and about three to four centimeters dilatation, with head high. Abdominal examination showed the back to extreme left, position O. L. P., and the fetal heart tones to the extreme left and normal in character. At 10:00 P. M. she was given sodium amytal grains iii following which the pains became more frequent and of greater duration. At 11:15 P. M. the patient was given a hypodermic injection of dilaudid grain 1/32 and scopolamine grain 1/200. At this stage, the dilatation was about six to seven centimeters but there had been no descent of the head although the pains were very strong. She was given great relief by the injection and the interval between contractions increased. At 4:15 the following morning a second injection of dilaudid 1/48 and scopolamine 1/300 was given. At 5:00 a large amount of bloody discharge was noted, the dilatation was increasing and the head rotated and descended almost to the pelvic floor. At 6:05 she was sent to the delivery room, gas anesthesia was started at 6:35, which the patient did not take well. Dilatation was complete at 7:00. At 7:40 there was bulging and without any warning she went into an eclamptic convulsion which lasted five minutes. She was prepared for immediate delivery and put up in stirrups, ether anesthesia was given, left episiotomy performed after application of forceps and a living baby girl was delivered at 8:00 A. M. Placenta was delivered complete and intact at 8:10 and the pelvic floor was repaired in the usual manner. Due to the condition of the patient she was kept in the delivery room and watched by a special nurse. At 1:00 P. M., hyperventilation was given and at 1:45 she was again seized with a convulsion. Blood pressure was taken again shortly afterward and showed 190/100 and a specimen of urine albumin +++. Patient was given 10 c.c. of a 25 per cent magnesium sulphate solution intravenously. At 5:45 dilaudid grain 1/20 given hypodermically and at 7:05 another intravenous injection of magnesium sulphate of the same dosage as before was given. At 10:30, a dilaudid suppository 1/24 grain given, which was repeated every six hours. She was again hyper-

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A Study of Artificial Pneumothorax: Course, Duration and Re-expansion*

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IN SANATORIUM practice, the controlled administration of air into the pleural cavity is the commonly applicable and safe method of collapse therapy. The ultimate success of the procedure, nevertheless, is not assured until the collapsed lung with its hidden area of tissue-repair has resumed its suspended function. That the lung and pleura may not do so easily, rapidly and without trauma from respiratory effort is a sufficient reason for hesitancy and postponement in re-expansion. Consequently, sanatorium care may be prolonged, and clinics may be burdened with an increasing load of re-fill cases who are allowed home care.

The American Sanatorium Association in 1933 summarized results in 398 cases selected from reports of 17 representative sanatoriums in the United States and Canada. In brief, the committee found that pneumothorax had to be discontinued in about two-thirds of the cases, that the completeness of the collapse is the greatest single factor in successful re-expansion, that destruction of lung tissue from cavitation was present in about two-thirds with more than half of these of the gross or multiple type. On the contralateral side one-third had a moderate lesion, one-third had a slight lesion, and one-third had no lesion. Cavitation on the contralateral was present in less than 1%. The committee also called attention to the honest differences of opinion existing as to the proper limitations and extensions of collapse therapy, especially of artificial pneumothorax, and cited various factors as a basis for investigation of end results.

E. N. Packard in 1932 reported a series of 105 cases from private practice, and from the records of Trudeau and Raybrook Sanatoriums. Re-expansion had been complete from one to 18 years. Eighty-one patients, or about 77%, were living at the time of his report.

His conclusions were:

(1) That effective collapse will successfully heal the lung.
(2) That re-activity is the exception where the collapse is satisfactory.
(3) That effective pneumothorax for two years, with one year of negative sputum may be considered a safe time-rule for re-expansion.
(4) That patients with closed cavities in which the space has been lost have no more reason to fear re-activation than those in which the pneumothorax could be no longer continued.

In this study of Nopeming cases I have endeavored to follow the plan of the American Sanatorium Association, noting:

(1) Condition of homolateral and contralateral lung.
(2) Amount and effectiveness of the collapse and effect upon physical signs, including sputum.
(3) Observation of re-expansion.
  (a) Unintentional—When the space was lost.
  (b) Intentional—When the lung was "let out."
(4) Intrinsic lung-factors.
  (a) Cavities.
  (b) Areas of infiltration.
  (c) Allergic state of the tissues.
  (d) Complicating lung diseases as pneumoniconiosis, emphysema, bronchiectasis, fungi.
(5) Extrinsic lung-factors.
  (a) Adhesions.
  (b) Pleural effusion.
  (c) Tuberculosis in other organs.
  (d) Diabetes, amyloid, etc.

This series commences with 300 initial pneumothoraces: Of these, 90 were unsuccessful because of adhesive pleuritis.

I. *Analysis of the failed initial attempts:*

Classification:

Far advanced	80
Moderately advanced	8
Suspect	2

Later History—38% have died; 38% are in hospitals and sanatoriums; 24% are home and working.

Cavitation was present in 80 cases.

Of the Entire 90—16 had thoracoplasty, and 54 had phrenicneurectomy.

Of the 24% Home and Working—3 had thoracoplasty, and 11 had phrenicneurectomy.

*Read before the Minnesota Medical Association, July 16, 1934, at Duluth.

II. *Of the 210 Successful Initials:*

(1) Average duration of collapse, 13 months.
Average amount of collapse, 59%.

(2) Sputum:

	Cases	Per Cent
Became negative	98	46.6
Remained positive	83	40.0
Former negative (remained)	24	12.0
Unaccounted	2	1.4

(3) Later Operative History—18 had thoracoplasty; 54 had phrenicneurectomy; 2 had pneumolysis; 1 had pneumo in good lung following thoracoplasty, and 2 had bilateral pneumothorax.

(4) Re-expansion occurred ..... 100 cases
(a) Unintentional (space lost) ... 60 cases
(b) Intentional (letting out) ..... 40 cases

Unintentional ..... *60 cases*
(a) Classification:
Far advanced 51
Moderate advanced 9
(b) Average duration ..... 10⅗ months
(c) Average amount of collapse 46%
(d) Fluid present ..... 26 cases
Fluid aspirated ..... 21 cases
(e) Adhesions 100%
Cavitation 90%
(f) Termination:
Living ..... 34 patients
Died ..... 26 patients

Intentional ..... *40 cases*
(a) Classification:
Far advanced 31
Moderate advanced 9
(b) Average duration ..... 21⅓ months
Average amount 60%
(c) Fluid ..... 8 cases
Aspirated ..... 6 cases
(d) Termination:
Living ..... 32 cases
Unaccounted or died ..... 8 cases

Of the 210 cases, 64, or about 30%, are still taking pneumothorax. Of these, 12 have positive sputum, all due to the presence of thick-walled or suspended cavities with adhesions. Two of this group are taking bilateral pneumothorax.

Of the Entire 300 Cases—Adhesions present in 66%, and cavitation present in 60%.

Adhesions were present in all of the 60 cases in which re-expansion was unintentional, which together with the 90 failed initials (with 100% adhesion) gives 150 cases, leaving only 16% of adhesive pleuritis to the favorable groups which include:

(a) Forty intentional re-expansions.

(b) Sixty-four patients who are now having pneumothorax continued.

We are forced to conclude that the more prolonged duration of artificial pneumothorax is directed generally toward those groups in which the prospect of a favorable "letting out" is greatest. "We may pertinently inquire whether later re-expansion of the lung is hampered by a prolonged period of collapse."

Pneumothorax is now being used in from 40% to 75% of sanatorium admissions. In addition it is an office procedure of clinic groups and chest diagnosticians everywhere.

During recent years, earlier diagnosis of subclavicular lesions and collapse therapy are accomplished without the former delay. Where this is done, as suggested by Fischel, as a preventive measure against cavitation and adhesion, a larger number are thrown into the favorable groups with a subsequent larger number of successful and planned re-expansions. *For the same reason, the average necessary duration of lung collapse should be shortened in these groups, especially in uncomplicated centrally located lesions of recent infiltration where treatment has been instituted promptly after the usual few weeks of observation under rest therapy.*

Other things being equal, it is possible to secure successful re-expansion in a goodly percentage of these patients after a shortened period of collapse therapy during which the sputum has been negative. In our series so much diversity existed in the type of the initial lesion, and variation in the course and progress of the collapse that no definite classification or fixed plan could be attempted. It seems safe, however, to call attention to the increasing number belonging to favorable groups and to emphasize certain features that favor the plan of early re-expansion.

(1) *Favorable Factors of the Original Lesion.*
(a) No cavitation, or soft walled cavities of recent origin.
(b) Effective collapse of infiltration areas, irrespective of the amount of lung involved.
(c) Absence of adhesive pleuritis, together with a central subclavicular location of the lesion.
(*Note*—Adhesions are absent or minimal in about 33%.)

(2) *Favorable Factors During the Course of Collapse.*
(a) Absence of fluid.
(b) Absence of allergic manifestations.
(c) Clear or clearing contralateral lung.

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Iron in the Treatment of Hypochromic (Secondary) Anaemia

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IRON has long been considered a sovereign remedy. The pantheistic Greeks believed that Mars had imbued iron with a force and properties not inherent in the metal itself and that it acted as a vehicle for the transmission of divine power. A somewhat kindred attitude may be deduced from the reverence which suggestible patients pay to iron therapy. They certainly would agree with Sydenham's dicta: "Take some remedy drawn from Mars. The Mars communicates to the mass of weakened blood a certain fire and vitality which raises and reanimates the broken down spirits."

The early pharmacopeias called iron Mars, as Sydenham did. It is known that Hippocrates used iron, but largely as a styptic. Pliny mentions iron as a cure for alopecia; Galen advises it in "splenic engorgement."

P. Blaud, "médecin en chef de l'hôpital de Beaucaire" in a paper "Sur les maladies chlorotiques et sur un mode de traitement spécifique dans ces affections" introduced his pills to the world in 1832. His thirty case histories make fascinating reading, with their notes on "une pâleur extrême," "un pouls petit et très fréquent," "une grande faiblesse générale," "une grande lassitude." Blaud's directions were to begin with two pills daily and increase up to four pills three times a day on the sixteenth and seventeenth days, continue until symptoms disappear and then return in inverse order to minimal dose and no treatment. Of his thirty cases, a third were cured in less than twenty days, most of the remaining cases in less than twenty-six days and "only one case was prolonged to thirty-two days."

Whipple's classic work with dogs is the basis for all the present day forms of administering iron. He showed that in anaemia from hemorrhage all inorganic iron salts were equally effacacious; that all iron over a certain dose was eliminated, but that real improvement came only after giving three to four times that dose. The cure was dependent upon the availability of an excess amount of iron. In his experiments, he showed conclusively that there was no advantage in giving iron subcutaneously or intravenously.

Much clinical data has now been accumulated which proves that humans react as do dogs in this respect. Many papers have recently been published upon the treatment of hypochromic or secondary anaemia. Murphy especially has published a number of articles upon the use of large doses of iron in the hypochromic anaemias. Some of his work shows that many cases improved more rapidly when iron administered orally was supplemented by intramuscular injections of concentrated liver extract. We have had no experience with the injections, as our cases have improved rapidly upon iron alone.

At the University of Michigan Health Service, we see a large number of young women of college age and the accompanying tables show our results in treating some of them for hypochromic anaemia.

The treatment of this condition is of great interest. In therapy there are certain practical considerations which can not be overlooked. Ease of administration and absence of gastro-intestinal complications are especially important in iron treatment. Thus, reduced iron in capsule form has much to recommend it. It is very easy to take and, in our experience, is less liable to cause gastro-intestinal disturbance, especially diarrhea, than other forms of iron. As may be seen from the tables, it has been the drug of choice. An occasional patient will complain of abdominal cramps and diarrhea necessitating withdrawal of the medication. This reaction may sometimes be prevented by following Monsieur Blaud's method of beginning with less than the desired dose daily and gradually increasing it. More rarely constipation may develop during the course of treatment. A change to Ferric Ammonium Citrate in 25 per cent or 50 per cent solution will usually be found to be laxative enough so that no other treatment of the constipation needs to be instituted. This solution must be taken through a tube to avoid discoloration of the teeth.

In the accompanying tables, it will be seen that most of the cases were given reduced iron. In those with marked anaemia, there was an average increase of 15.6 per cent in the hemaglobin percentage, within an average of 33 days of treatment. It will be noted that Case III had a tendency to relapse, without any apparent cause, but responded quickly to iron therapy.

TABLE I

Results of iron therapy in hypochromic anaemia in young university women. There is an average increase of 15.6% in the hemaglobin.

Case	Before —Treatment— Hgb. % (Sahli)	R. B. C. Millions	Type of Treatment	Duration of Treatment (Weeks)	After —Treatment— Hgbn.	R. B. C. Millions
I.	50	2.53	Fe. Red. /6 b.i.d.	4	58	3.42
II.	58	....	Fe. Red. /6 b.i.d.	4	70	4.9
III.	49	4.0	Fe. Red. /6 b.i.d.	6	80	4.91
One Year Later	66	4.37	Fe. Red. /6 b.i.d.	4	77	4.3
IV.	53	4.1	Fe. Ammon. Citrate 50%	3	..	....
			Fe. Red.	4	79	5.0
			Fe. Red. /6 b.i.d.	3	..	....
V.	49	4.89	Bland's gr. XX	8	65	4.58
VI.	35	2.08	Fe. Red. /5 t.i.d.	4	68	4.03
VII.	60	....	Fe. Red. /6 b.i.d.	4	72	4.95
VIII.	58	....	Fe. Red. /6 b.i.d.	3	68	4.66
IX.	65	4.3	Fe. Red. /6 b.i.d.	4	78	....
X.	63	3.99	Fe. Red. /6 b.i.d.	4	72	....
XI.	52	3.87	Fe. Red. /6 b.i.d.	3	64	....
XII.	66	3.930	Fe. Red. /6 b.i.d.	3	76	3.99

TABLE II

Results of iron therapy in mild hypochromic anaemia in young university women. There is an average increase of 9.4% in the hemaglobin.

Case	Before —Treatment— Hgb. % (Sahli)	R. B. C. Millions	Type of Treatment	Duration of Treatment (Weeks)	After —Treatment— Hgbn.	R. B. C. Millions
XIII.	68	....	Fe. Red. /6 b.i.d.	3	75	....
XIV.	68	....	Fe. Red. /6 b.i.d.	2	82	....
XV.	70	....	Fe. Red. /6 b.i.d.	2	76	....
XVI.	69	....	Fe. Red. /6 b.i.d.	3	73	....
XVII.	69	4.15	Fe. Red. /6 b.i.d.	4	75	4.71
XVIII.	70	4.21	Fe. Red. /6 b.i.d.	4	86	4.80
XIX.	68	3.87	Fe. Red. /6 b.i.d.	4	75	....
XX.	70	....	Fe. Red. /6 b.i.d.	3	78	....
XXI.	68	3.38	Fe. Red. /6 b.i.d.	4	80	4.43
XXII.	68	3.88	Fe. Red. /6 b.i.d.	6	79	4.72
XXIII.	68	....	Fe. Amm. Citrate (25% sol) 4/ t.i.d.	3	80	4.74
XXIV.	70	....	Fe. Red. /6 b.i.d.	4	82	4.73
XXV.	66	....	Fe. Red. /6 b.i.d.	4	75	4.54
XXVI.	70	4.45	Fe. Red. /6 b.i.d.	4	80	4.88
XXVII.	65	3.73	Fe. Amm. Citrate (50% sol) 4/ b.i.d.	4	73	4.59

It is interesting to note decrease in complaints, especially that of easy fatigue, with smaller improvements in hemaglobin content. With this in mind, Table II was prepared. Most of the cases had only slight reductions in hemaglobin. They show an average increase of 9.4 per cent in the hemaglobin with an average treatment time of 25 days.

With results like these from iron by mouth, it is apparent that iron orally is the ideal method of treating hypochromic anaemias. It is simply a matter of regulating the form and of making certain that the amount of iron is adequate. Since the dosages are so much larger than the old standards, the pharmacist should be taken into the physician's confidence, as an occasional case has arisen where the pharmacist has hesitated to fill the prescription.

Summary

Data on twenty-seven cases of hypochromic anaemia is submitted to show how readily this condition responds to the administration of large doses of iron by mouth. Reduced iron in capsule form has been the drug of choice, as it is easy to take and usually does not cause gastric irritation.

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Eye Injuries*

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SINCE I have practiced ophthalmology I have done work for several railroads. During this period a number of cases have come under my care that have made me think a paper on eye injuries at one of our meetings would be very appropriate and when the call came this year I volunteered to present an article on the supject.

As a rule, the accident case first comes under the observation of the general practitioner and since the final result so frequently depends upon the care the eye receives during the first 24 to 48 hours, the doctor along the line should be acquainted with some of the dangers and difficulties that not infrequently result from what at first appears to be a very minor injury.

Foreign bodies imbedded in the cornea constitute the most common eye injury we have. These cases practically all recover promptly with proper treatment.

Every general practitioner should have a Berger or Beebe loupe for it is practically impossible for the normal eye to see some of these small particles or corneal abrasions without the aid of a good light and a loupe. I prefer the Beebe loupe for it fits over regular glasses easily.

The first thing that should be done in these cases is to take and record the vision, for the progress of the case can very frequently be determined by comparing subsequent vision tests with that recorded at the first examination. After the vision is taken the eye should be inspected with the loupe for foreign particles, abrasions or opacities. Whether or not any lesions or foreign bodies are found, the next procedure is the putting in of an anesthetic. I prefer pantocain, one per cent solution, a drop every couple minutes for four or five doses. Butyn is also frequently used but I have found that the first couple drops burn much more than does the pantocain. Cocaine, four or five per cent solution, serves very well, the only objective to its use being that it dilates the pupil. This, however, is of no serious consequence unless the eye happens to be a glaucomatous one.

If a foreign body is found it should then be removed with a spud. An assistant should hold open the lids and the loupe should be used when removing the foreign particle for it is very important to apply the spud to the effected part only. Frequently these particles are easily removed but a burned area or rusty stained area remains which serves as a foreign body and it is very important that this should be curetted out.

If no foreign body is found the next thing to do after the eye is anesthetized is to apply a drop of fluorescein which is prepared as follows: Fluorescein, gr. V, sodium bicarbonate, gr. X, and distilled water to one ounce; shake well and allow to stand uncorked over night, then filter. Then wash out the eye with boric solution. If the foreign particle has caused an abrasion this area will be stained green. Very frequently I have failed to detect an abrasion until after staining with fluorescein.

It is important to make a diagram on your record of this stained area. At subsequent treatments another application of fluorescein, to note whether the stained area is decreasing in size or is larger than your original diagram, will aid materially in noting the progress of the case. Fluorescein should never be applied without first putting in a few drops of anesthetic for it smarts quite severely and the comfort of the patient should always be considered. After the foreign body has been removed or a staining area has been noted my practice has been to apply 1/5,000 or 1/3,000 bichloride ointment depending upon the severity of the injection, then put on a patch. Usually the abraided area will be healed over when inspected the next day. The reason for applying the patch is to keep the lids from moving and irritating the raw surface.

Foreign bodies in the conjunctiva or very small abrasions of the conjunctiva are less dangerous than those of the cornea but should receive the same treatment as above described for corneal lesions.

Lacerations of the conjunctiva unless they are ragged usually heal without suturing. Where the laceration is large or ragged the edges should be approximated with either silk or linen sutures and bichlorid ointment and a bandage or patch applied.

Burns of the lids or conjunctiva in the lower cul-de-sac frequently are followed by adhesions or symblepharon that cause turning in of the lid which will necessitate subsequent plastic surgery. Boric irrigations, frequent applications of bichlo-

*Read before the Great Northern Railway Surgeons Association at Glacier Park, Mont., June 30, 1934.

ride or butesin picrate ointment and rest are indicated. For the first 24 hours I use ice compresses after which I use hot applications.

If injection continues in these corneal affections for more than a couple days iritis should be suspected. It is not infrequent for an ophthalmologist to be undecided as to the development of iritis. A mild case of plastic iritis is often difficult to differentiate from a moderately severe conjunctivitis. Atropine is always indicated in iritis, it is never indicated in a simple conjunctivitis. When there is doubt dilate the pupil with homatropine, two per cent solution; this is augmented by using five per cent cocaine every other application. Two or three applications of each at five-minute intervals is usually sufficient to produce dilation. If the pupil dilates normally and on inspection with the loupe no iris pigment deposits are found on the anterior capsule of the lens or if no anterior capsular opacities are seen, atropine does not need to be used. If these are found then atropine should be prescribed, a drop of one per cent solution three or four times a day, and hot compresses applied.

Blows to the eye cause a variety of injuries, minor to very severe. Ecchymosis of the lids and subconjunctival hemorrhage while distressing to the patient are of no consequence. Ice compresses for the first 24 hours, then hot compresses are the only treatment necessary. The patient should be told it will take about two weeks for the discoloration to disappear. Here, again, it is very important to take and record the vision for if the vision is markedly reduced, intraocular injury must be suspected.

Fractures of the bony orbit may be serious, but if there is not much displacement it is best to leave them alone. If the ethmoid plate is fractured there might be emphysema. The patient should be warned to not blow the nose.

In optic foramen, sphenoidal fissure or basalar fractures the prognosis is grave. X-ray might show the fracture but usually the results are not satisfactory. Sudden loss of vision follows a fracture in the optic foramen, this is permanent and within a month or six weeks the disc is pale.

Blood in the anterior chamber from a blow may be due to only a very small iris laceration. If so, no serious result follows and with rest and hot compresses recovery occur in two days to a week. If the blood does not fill the anterior chamber one should not fail to take and record the vision for the same reason as mentioned above.

Blows not infrequently cause subluxation or dislocation of the lens. This is noted by a tremulous iris which is best determined by inspection with the loupe and asking the patient to quickly look from one point to another.

Detachment of the retina, rupture of the choroid and retina are other serious results of blows to the eye. Vision is always affected immediately in these cases depending, of course, upon the extent of the detachment or rupture. An undiagnosed retinal detachment may prove very embarrassing for the attending physician. It is well to withhold diagnosis in these suspected cases. This is especially important if there is blood in the anterior chamber. One should wait until the blood is absorbed when an intraocular examination can be made. Field tests are also extremely important in suspected detachment cases. Retinal detachment is one of the most serious eye defects but some shallow detachments do subside with complete rest in bed for weeks.

I have also had several cases of traumatic mydriasis from blows. The pupil is widely dilated and, of course, there is blurring especially for near. The prognosis should be guarded here for many of these cases do not recover. If the pupil remains dilated for six months it is safe to say the defect is permanent.

Macular disease sometimes results from blows. During the past year one of our section foremen sustained a blow in one eye causing a hemorrhage in the macula region and a few weeks later he had a blow in the other eye with a similar result. Of course, these hemorrhages are more apt to occur in elderly people with increased blood pressure and a certain amount of sclerosis.

Traumatic cataract occasionally occurs from blows but, of course, the most common cause is a penetrating or perforating injury.

Penetrating or perforating wounds are always serious and the patient should have care equal to that given a fractured skull or a gunshot wound case. Rest should be instituted at the earliest possible moment for exertion sometimes complicates the case by causing additional hemorrhage which might injure the eye beyond repair.

The next danger of these cases is infection, for one can never be sure that the foreign body or penetrating instrument is sterile or does not carry in bacteria. Emergency treatment should be gentle irrigation with boric solution, the application of bichloride ointment and a bandage. Of course, if the wound is so extensive that the eyeball is collapsed it is perfectly proper to immediately enucleate it.

If the iris is injured or if the wound is in the ciliary region, atropine should be used immediately. I usually use it in the form of an ointment in combination with bichloride of mercury.

There are some who consider these cases infected right from the start and immediately institute protein treatment. Intravenous injections of dead typhoid bacilli, subcutaneous injections of diphtheria antitoxine, omnadin or boiled milk are among the proteins used. I usually use whole milk boiled three minutes, 10 c.c. being used every other day intramuscularly for as many as five doses. If no result is obtained by that time it is useless to continue that treatment.

An irremovable foreign body is always serious, but not all of these cases are hopeless. The patient should, however, be told of the dangers of sympathetic ophthalmia and an ophthalmologist should be consulted immediately upon the development of blurring, pain or any irritative symptoms.

An irritable eye with an intraocular foreign body is a source of danger to the sound eye and should be removed.

If there is a prolapsed iris from a penetrating wound the prolapsed portion should be excised and the edges should be freed from the wound. An iris prolapse or an iris adherent to a wound is a constant source of irritability and serious after-effects not infrequently result.

Much more could be said regarding the care of corneal ulcers, uveitis and panophthalmitis but the object of this paper is chiefly to call attention to some of the dangers of eye injuries and to emphasize the importance of proper emergency treatment and the recording of vision. Of course, if an ophthalmologist is available these cases should be referred to him immediately after emergency treatment is given. If this is not possible and improvement cannot be noted during the first 24 hours or if there is much pain and symptoms of inflamation are manifest the patient should be transferred to a place where an ophthalmologist is available. I make this statement with all due respect to the general practitioner for I am sure you will agree with me that an ophthalmic opinion comes within the realm of one experienced in that specialty.

The Use of Dilaudid in Labor Post-Partum and Post-Operative

(*Continued from Page 715*)

ventilated that evening and repeated the next morning. Patient then ran a blood pressure of 140 to 175 systolic and 90 to 100 diastolic. She was given two more injections of magnesium sulphate at twenty-four hour intervals and the dilaudid was decreased to every eight hours on the third day, then two times daily for three days. On July 4, the urine showed only a trace of albumin, the blood pressure was 130/80 and she was very much improved. The baby had a gradual increase in weight but was not taken to breast; milk was obtained from another mother.

Summary

I. In labor the combination of dilaudid grain 1/32 and scopolamine grain 1/200 was very effective in producing a seminarcosis and especially so if preceded one to three hours by one of the barbiturates. It is interesting to note that in the group in which the dilaudid was given as the initial dose, 90 per cent felt the effects of the drug in five to twenty minutes, while 50 per cent of these were in a state of seminarcosis within thirty minutes. In the group in which sodium amytal grains iii to vi had been given previous to the dilaudid-scopolamine combination 90 per cent were in seminarcosis in twenty minutes.

II. The relaxation produced by the drug was responsible for a better quality of uterine contraction thereby shortening labor; in no case was labor prolonged on account of the dilaudid.

III. Nausea was produced in less than 10 per cent of the cases.

IV. There were no cases of asphyxia of the new-born that could be attributed to the dilaudid, there were three cases mildly cyanosed that were probably due to the action of the drug. In the 68 cases there were several stillbirths none of which were due to dilaudid, but to other causes.

V. Dilaudid did not increase the duration of the third stage of labor, nor was it responsible for any unusual hemorrhage.

VI. Used in the form of rectal suppository, in doses of grain 1/24, dilaudid excelled both morphine and codeine in post-partum or post-operative care; and it gave excellent results in inoperable carcinoma.

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The Common Cold Among College Students*

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THE common cold is a health problem of major interest to everyone engaged in college health work not only because it is responsible for more illness and loss of time than any other disease but also because students are unusually favorable groups in which to study its prevention and treatment. Various workers have taken advantage of these opportunities and have made studies which have added materially to our knowledge of this subject. The conclusions which can be drawn from certain of these studies on college students are as follows:

Etiology

A Filterable Virus: The first experiments pointing to an ultramicroscopic, filter passing virus as the cause of colds were made by Kruse[1] in 1914 when he inoculated 36 members of his bacteriology class with a filtrate of the diluted nasal discharge of a patient with an acute cold in the head. Fifteen, or 42 per cent, of these students developed typical colds while no colds developed in 29 uninoculated members of the class.

Bacteria, such as the micrococcus catarrhalis, the pneumococcus, and the streptococcus, and the bacillus of Pfeiffer seemed to be the etiologic agents of certain epidemics of colds in student groups reported by Clark and Murphy, of the University of Wisconsin;[2] and Davis of the University of Illinois.[3]

Climatic Factors: The relationship between the weather and the occurrence of colds in college students was studied by Smiley of Cornell University and by Gafafer of Johns Hopkins University. Smiley[4] found definite reciprocal relationships between the incidence of acute respiratory infections and both the mean outside temperatures and the average daily hours of sunshine. Gafafer[5] found that during the winter months there is a slight tendency for the attack rate for colds to rise when the temperature falls below its ordinary level. Temperature range, humidity, rainfall, wind velocity, per cent of sunshine and atmospheric pressure show no relation to the incidence of colds during this period. There is, however, very suggestive evidence that temperature changes are more associated with upper respiratory disease during the warm season, April to October, than during the colder weather, October to April.

Jordon, Norton and Sharp[6] report that the results to a questionnaire which they sent to students at Chicago University, Pasadena, California, and Galveston, Texas, indicate that: (1) There is no definite correlation between the type, severity, duration and frequency of colds except that infrequent colds tend to run a milder and often a shorter course; (2) there is no clear evidence that climatic conditions play a part in etiology of colds; (3) sixty-four per cent of students believe that their colds are due to such factors as chilling, exposure to cold, draft, or wet shoes or clothing; (4) only 22 per cent believe that contagion is a factor of importance; (5) the number of colds among those who practice "resistance building" like sleeping with open windows, wearing light clothing, taking regular exercise, are just as great as among those who followed no such measures.

In a small series of Yale students Winslow and Greenberg[7] found that chilling of the body surface resulted in ischemia and in dryness of the membranes of the nose; that chilling of the head caused less vasoconstriction of the mucous membranes than exposure of the entire body to a corresponding effective temperature; and that chilling of the feet actually caused dilatation of the blood vessels of the nose and throat.

Relation of other factors to the incidence of colds was investigated by Smiley[8] who reported that tobacco, dust, gas, mouth-breathing, sleep, draft, constipation, bathing and footwear are apparently not major factors in determining resistance to respiratory infections in the group of Cornell University students studied and that exercise seemed a liability rather than an asset in this group.

Epidemiology

From 1923 to 1925 the United States Public Health Service[9] conducted a systematic study of the incidence, symptomatology, and epidemic features of the common cold in certain student and family groups. The students in this study were from Harvard University, Mount Holyoke

*From the Students' Health Service and the Department of Preventive Medicine and Public Health, University of Minnesota, Minneapolis.

College, Johns Hopkins University, Georgetown University, Tulane University, University of Chicago, Ohio State University, University of Utah, University of Arizona, and University of California. The attack rates in these student groups were remarkably uniform, showing no consistent relation to latitude, longitude, or climate. During the period of high incidence the succession of epidemics which occurred in the several groups in widely different localities showed a striking time correspondence.

Barrow,[10] studying colds among students of Stanford University, found the incidence practically the same in the agreeable climate at Stanford as it was among corresponding groups of students in New York and Massachusetts. Whether the students used sleeping porches, well-ventilated bedrooms or poorly-ventilated bedrooms for sleeping purposes did not materially affect susceptibility.

Forsythe's[11] analysis of the incidence of colds among University of Michigan students from 1917 to 1931 shows a higher incidence in boys than in girls, and annual peaks for both sexes in October, December, January and March.

Prevention

Specific and general measures for the prevention of colds have been studied in various student groups, but results for the most part have been inconclusive.

Vaccines seemed of some value to Lempriere[12] in student groups in England, but Ferguson, Davey and Topley[13] at the University of Manchester, and Brown[14] at the University of Cincinnati found no significant differences in the incidence of colds in groups of vaccinated and groups of unvaccinated students.

Ultraviolet irradiation of the body for ten to sixteen minutes once a week seemed to Maughan and Smiley[15] in 1929 to reduce the incidence of colds by 40 per cent in cold-susceptible students. Doull, et al[16] failed to find any significant reduction in the number of colds which occurred in a group of medical students at Johns Hopkins University who received regular ultraviolet irradiation during the winter months as compared to a group who received no such treatment. Reporting on further studies in 1932, Smiley[17] concluded that "the interest of at least one-seventh of cold-susceptible students in the prevention of colds can be aroused and sustained by offering cold prevention classes. If in these classes matters of diet, alkalization, ventilation, toning up of the skin by ultraviolet rays or sunlight, and in special cases the correction of nose and throat abnormalities and the use of vaccines are stressed, an average reduction of approximately 46 per cent of the incidence of colds can be prophesied. Which of these factors is most important is a question but the ultraviolet or sunlight bathing is undoubtedly an essential factor in arousing and sustaining the interest of the patient in the project."

Vitamin A for the prevention of colds was recently studied in a group of students at Western Reserve University by Shibley and Spies.[18] They administered vitamin A in the form of halibut liver oil in excess weekly over a period of fifty-six weeks to a group of approximately 100 students, and kept careful records of the incidence of colds in this group as compared with the incidence in a group of 100 other students used as a control. Neither incidence nor severity of the colds was affected by the vitamin supplement, although there was some suggestive evidence that the duration of the colds was shortened by two or three days during the winter months.

Hardening processes such as outdoor exercises, cold baths and similar measures, although frequently advocated for the prevention of colds, seemed completely ineffective in a controlled study conducted by Gafafer.[19] This study, in which medical and public health students in Johns Hopkins University served as subjects, indicated that outdoor exercises had no influence on the incidence of colds and the only effect of sleeping with wide open windows is that higher percentages of colds are accompanied by cough.

Tonsillectomy — Although tonsillectomy is doubtless indicated in certain patients with recurrent colds, the studies of Forsythe[20] at the University of Michigan, and of Smiley, of Cornell,[8] indicate that the incidence of colds in college students who have had their tonsils removed is just as high as in those who still have their tonsils.

Treatment

The treatment of the common cold has been a subject of study by the Health Service of the University of Minnesota for some years. One of the earlier studies[21] showed that the results obtained with the inhalation of dilute concentration of chlorin were not enough better than the results obtained with less burdensome methods of treatment to justify the continuance of the chlorin treatment chamber.

More recently we have been investigating various drugs used in the treatment of colds. The results of these studies[22] [23] seem to justify the following practical conclusions:

Studies concerning the prevention or treatment

of colds need to be very carefully controlled. In our studies students with colds saw physicians who made whatever examinations were indicated, recorded symptoms and findings, and wrote prescriptions for "cold medication." These prescriptions were filled by a pharmacist who used in sequence the medications being studied at the time. Four days later cards reporting the subsequent courses of their colds were submitted by the patients. On the basis of these reports the results of the treatment were rated by two physicians, neither of whom had any knowledge as to what medication had been used by the patient. The ratings used to designate results were "definite improvement or complete relief, questionable improvement and no improvement" within 24 to 48 hours after first taking the medication. In final analysis, however, only reports of "definite improvement or complete relief" were considered significant. Finally the pharmacist's records were obtained and the results classified as to type of cold and the medication used.

Between 30 and 40 per cent of students with acute coryza reported "definite improvement" or "complete relief" in 24 to 48 hours after taking sugar capsules which were used for a control. This represents a degree of spontaneous improvement which must be considered in the evaluation of other forms of treatment.

Opium and at least several of the alkaloids derived from it are of distinct value in the treatment of the common cold. The chief effect which they produce is a prompt reduction or complete disappearance of the nasal discharge and congestion. In most cases when the nasal discharge and congestion is kept under control little if any further progress of the cold is noted. Of the numerous preparations investigated the one which seems most desirable for general use is a combination of codeine sulphate one-fourth grain with papaverine hydrochloride one-fourth grain.** Seventy-two per cent of 1,500 students with acute coryza reported distinct improvement or complete relief within 24 to 48 hours after starting treatment with this preparation; its toxicity is low and it can be used for the treatment of colds without danger of habituation.

The percentage of patients who reported beneficial results with other medications such as quinine, acetylsalicylic acid, a calcium-iodine preparation, halibut liver oil, sodium bicarbonate, and ephedrine sulphate by mouth were slightly greater than the percentage who reported benefit from the sugar capsules which we used as a control, but decidedly less than reported improvement with morphine, dihydromorphinone hydrochloride, or the codeine-papaverine combination.

Atropine sulphate by mouth and one per cent ephedrine sulphate used locally in the nose usually caused dryness of the mouth and temporary relief of nasal congestion, but from the reports submitted neither seems of real benefit in the treatment of coryza.

Two preparations nationally advertised by radio and newspapers and used by millions of people for the treatment of colds were included in the study. One is taken by mouth, the other dropped into the nose. The former gave results very little better than the sugar capsules; while the latter is clearly of no value whatsoever.

Other studies which were made concerning the codeine-papaverine combination indicate that (1) the mixture of codeine and papaverine utilized gives a significantly higher percentage of good results and is distinctly less toxic than a corresponding quantity of codeine alone or of papaverine alone; (2) the optimum dosage of this mixture for an adult of average weight is one tablet or capsule after each meal and two at bedtime; if the cold is well-established this dosage should be continued for two or three days; (3) the earlier the treatment is instituted the higher the percentage of good results obtained—in fact, if this preparation is utilized at the very onset of symptoms a few tablets or capsules are frequently sufficient to prevent further progress of the cold; when treatment is delayed to the third or fourth day the proportion of beneficial results declines from 73.3 per cent to 60.4 per cent; (4) students who used this preparation for the treatment of coryza lost less time from school than those who used other medications.

**The exact preparation used in this study was Copavin (codeine sulphate ¼ grain with papaverine hydrochloride ¼ grain) manufactured by Eli Lilly and Company of Indianapolis under license from the University of Minnesota.

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A Study of Artificial Pneumothorax: Course, Duration and Re-expansion

(Continued from Page 717)

(d) Absence or improvement of tuberculosis in other organs.

(e) Improved sedimentation curve.

(f) Prompt disappearance of bacillary sputum.

(g) Mobile mediastinum.

Hesitancy in letting out the lung in these favorable types may be as expensive as failure to secure early diagnosis and prompt sanatorium care.

It is noteworthy that in 40 cases of planned re-expansion the average duration is 21¼ months. A few of these bordered upon the less favorable class on account of adhesions and other drawbacks. Yet the average time is considerably shorter than the two to five years so frequently and conservatively quoted. All of which suggests that it may be a finer conservatism to carefully select and classify our patients from the beginning, and to base the duration of a planned collapse upon the character of the lesion and whatever modifying circumstances may supervene during the earlier months of observation.

Cases which go to thoracoplasty and other surgical collapse treatment belong chiefly to the class in which pneumothorax has failed at the start, and to the group where pleural space had to be abandoned.

Both of these groups should be scanned repeatedly for positive bacilliary sputum, which seems to be the chief reason for radical surgical collapse. In our selections for thoracoplasty, we routinely use a G. I. series, electrocardiograph and study of renal function or the possible presence of amyloid.

Summary and conclusions:

1. The most effective pneumothorax cases are those in which adhesions or cavitation are minimal or absent.

2. The increasing use of artificial pneumothorax in the earlier types of adult lesions has produced an increasing number in the favorable groups for re-expansion.

3. Early re-expansions may, at six to 12 months, be safely used in an increasing number of favorable cases.

4. Prompt abandonment of a partly effective pneumothorax is advisable when sputum remains positive.

5. A more prompt and frequent use of the radical forms of surgical collapse should precede and supplement rest therapy in a larger percentage of those groups in which artificial pneumothorax fails originally or later from lost space, *in all cases in which sputum is permanently or intermittently positive* or in which open cavities persist.

The
JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA, *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

North Dakota State Medical Association
South Dakota State Medical Association
Montana State Medical Association
The Hennepin County Medical Society
The Minnesota Academy of Medicine
The Sioux Valley Medical Association
Great Northern Railway Surgeons' Assn.
American Student Health Association
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MINNEAPOLIS, MINN., NOVEMBER 15, 1934

STATISTICS

Statistics have their place, of course, and often serve useful purposes, especially in fields of experimental work. The conclusions that are drawn from them, however, are far from infallible. Inductive reasoning lends itself so readily to insidious sophistry.

When statistical charts are exhibited or their contents quoted at great length, a bantering subtlety from the PRISON MIRROR of "the gay 90s" often comes to mind. The MIRROR was edited by some of the convicts in Stillwater, who helped to dispel the gloom of immates by their sly jests. It ran something like this: "A census has been taken of the prison population and it was found that 83 per cent of the men here incarcerated are single and only 17 per cent married, which goes to show how many men prefer a prison cell to a married life." Women might say that it demonstrated the comparative goodness of men after they were married, and men twinkle-eyeingly observe that it indicated that married men didn't have to go away from home for trouble or punishment and so on and on.

When it comes to comparative statistics we find that only a very small percentage of the country's prison population is feminine. Now then, is this because of their own innate goodness or *ipse dixit* because of their association with the male whose influence has elevated them to Elysian heights of purity and perfection? Comparisons were odious even before Shakespeare's time and when they are hooked up with statistics make a two-edged sword of invidious possibilities. Statistics are all right and the women are wonderful but best results are obtained by a careful handling of each.

A. E. H.

THE NEW AND THE OLD

Sometimes we wonder if too much stress is not given to medical economics these days, or the economic depression in general, for that matter. It has been a favorite subject for some time, and certainly not a pleasant one. We compare the present with the past and talk about the good old days when it was thus and so. How many of us have seriously considered how good the good old days really were, and how many would choose to be back?

Now-a-days we are freely giving advice by phone to every anxious mother and son all over the land, and at the same time inwardly complaining that this modern, convenient but also leachy invention has succeeded in tapping a considerable portion of the physician's revenue. In years gone by we received three-word telegrams, peremptorily written "Come at once," when seven wasted word spaces might have been used to indicate

without additional cost, whether we were expected to attend a confinement, a broken leg or a teething child. With no other information available, we had to go with full equipment, forceps, saw, knives, intubation outfit, fresh antitoxines and all sorts of emergency supplies. We rode the caboose of the local freight train, waded through the snow, froze as the wintry winds blew their chilling blasts about us on railway sidings and at junction points where we were forced to await the uncertain destiny that lay before, only to be invited by a lanterned messenger to further adventure by "tie pass" or hand car to some out-of-the-way shack. Sometimes the need was urgent, when hardships and financial remuneration were entirely forgotten for that satisfied feeling that comes from a realization of work well done. All too often, on the contrary, the perils of such rashly conceived trips proved entirely unnecessary, and had a telephone been available these inconveniences might have been avoided through the exchange of a few sentences and some appropriate suggestions.

In either case, the financial reward was never great. If the old man called you "Doc," and cheerfully regaled you with accounts of the princely fortune he had already expended in the care of his rheumatic spouse, it was a fairly accurate index too of his familiarity with evasive methods of handling resultant obligations. Only the old fashioned coin-flipping credit guide was available for further consultation, and this was infallible only in degree: heads, he'd pay perhaps; and tails, maybe.

These modern inventions may be used at times to take advantage of the doctor; but he, in turn, may take advantage of them, and by so doing save himself much annoyance and grief. After all, he does not need to give prescriptions away by phone any more than when these or other services are rendered at the home or office. Then again a telephonic inquiry always affords an opportunity of suggesting a house visit at a convenient time or stressing the need of a more thorough examination at the office. We dislike to profane these pages, devoted as they are to Hippocratic lore, by the injection of so vile a word as business, but with the exigencies that now exist we feel constrained to say that those who complain of the stealthy telephone should consider its proper use, even as a helpful "business getter." As Thanksgiving day approaches, we are thankful for the new and would learn to tread its paths aright. A. E. H.

THE CONTROL OF THE FEEBLE MINDED IN SOUTH DAKOTA

In 1931 the legislature of South Dakota enacted a law which greatly amplified the scope of the work of the State Commission for the Control of the Feeble Minded, which had been in existence since 1924. This commission is composed of Dr. F. V. Willhite, chairman, who is superintendent of the State School and Home for the Feeble Minded at Redfield; Dr. G. S. Adams, superintendent of the Yankton State Hospital (for the insane); and Judge Lewis Larson, county judge at Sioux Falls, whose duties also include those of Judge of Juvenile Court there. The increased duties under the new law provide for state wide supervision of the feeble minded in several highly desirable particulars. First, there is the provision for the identification and registration of all feeble minded in the state; second, the prevention of reproduction in suitable cases; third, the encouragement of all feeble minded persons to become adjusted to their surroundings, with the definite backing of constituted authority, and, fourth, the co-operation with school authorities in recognizing the defective child, and helping in outlining programs of training. All this is fully set forth in the Fifth Biennial Report of this Commission, just received, which recapitulates its activities in stating that the program "provides for the identification, registration, adjudication, supervision, sterilization, prevention of marriage and a continuative census of all the feeble minded in the state."

At the time of this report a total of 5,312 have been identified and classified out of an estimated population of 7,000 feeble minded in the state. Of this number 206 have died, and 173 have moved from the state, leaving a registration with the commission of 4,933, or approximately 70 per cent of the estimated feeble minded population. Of these, some 1,250 have been committed to the control of the State Commission.

In addition to this work, the State Commission has made examinations at various intervals from July, 1927, to January, 1931, of the prisoners confined in the state penitentiary at Sioux Falls. In all 946 were classified, and it is interesting to note that only 29 per cent of these showed average intelligence, 9 per cent bright, and 2 per cent superior; the rest were dull, border line or actually feeble minded, the last named 11 per cent. Both sexes were included, on the basis of 918 males and 28 women. A survey was also made

of 297 boys and girls in the training school at Plankinton, with the following result:

Feeble minded	12.8
Borderline	25.2
Dull	23.2
Average	24.6
Bright	12.1

These figures are highly instructive and suggestive. More than ever are we convinced that every state should have its psychopathic institute where criminals can be examined, diagnosed and classified for treatment or proper institutionalization. The best prisons or reformatories in the world do no good to mental defectives; they should be dealt with on an entirely separate basis from the criminal of average mentality. But these remarks are our own. Our main purpose in writing this editorial is to praise unqualifiedly the excellent work of the South Dakota State Commission for the Control of the Feeble Minded, and to urge that it be given proper support by public opinion and financial provision for the further carrying on of this important work.

G. C.

NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. A. F. Giesen, Starbuck, is the new president of the West Central Minnesota Medical Society.

Dr. J. H. Rieniets, who has been on the Mayo clinic staff for many years, is now with the Western Montana Clinic at Missoula.

Dr. Carl W. Laymon has recently opened offices for the practice of dermatology in the Medical Arts Building, Minneapolis.

Dr. H. J. Hall, Glendive, Mont., is in Chicago, where he is taking a post graduate course at the Cook County School of Medicine.

Dr. Paul Swedenburg, has become associated with his uncle, Dr. A. W. Swedenburg, in general practice at Thief River Falls, Minn.

Dr. C. C. Rasmussen, formerly located at Fertile, Minn., has moved to Springfield, Ill., where he will continue his general practice.

Dr. A. M. Snell, of the Mayo Clinic, addressed the members of the Medical Society at their monthly meeting held at Minot, N. D.

Drs. W. J. and C. H. Mayo, Rochester, have won their suit to stop the use of their name on mattresses manufactured by a certain company.

Dr. R. W. Henderson, Fargo, was among the members who were in attendance at the Army Medical School, recently held at Rochester, Minn.

Twenty hospitals in Montana have been approved by the American College of Surgeons, making a fine showing for the hospitals of that state.

The University of Minnesota Nurses Alumnae Association held their fall frolic at St. Paul last month, with a large attendance and a very enjoyable meeting.

Dr. David M. Daley, a graduate of the University of Minnesota Medical School, has recently located at St. Peter, Minn., and opened offices for general practice.

Dr. R. E. Scammon, dean of Medical Science at the University of Minnesota, delivered three lectures last month, before different clubs, at Grand Forks, N. D.

The North Dakota Anti-Tuberculosis Association celebrated its twenty-fifth anniversary at Billings last month, with a good attendance of members and an enjoyable reunion.

Miss Mabel Hertsgard, superintendent of St. Lukes Hospital, Fargo, was elected president of the State Nurses Association at the annual meeting recently held at Jamestown.

Dr. W. A. O'Brien, associate professor of pathology at the University of Minnesota, will direct the twenty-eighth annual sale of Christmas seals in Minneapolis and Hennepin County.

A new private hospital is to be erected at Hardin, Montana, that will cost about $20,000 when completed and furnished. Drs. Labbitt, Haverfield and Strang are on the list of directors.

Dr. Howard K. Gray, Rochester, was the guest speaker at the October meeting of the District Medical Society at Devils Lake, N. D. His address was on "Surgery of the Biliary Tract."

Dr. G. O. Fortney, prominent Zumbrota, Minn., physician, died last month after a long illness, at his home in that city. The doctor was 54 years of age and a graduate of Rush Medical College.

Dr. W. G. Magee, Watertown, president of the North Dakota Medical Association, is home again after a visit to Boston, where he attended the annual meeting of the American College of Surgeons.

Drs. E. G. Balsam, Earl Whedon, and Harvey Sethman, secretaries of the Montana, Wyoming and Colorado State Medical Associations, held an important conference at Sheridan, Wyo., last month.

The Northwestern District Medical Society held their October meeting last month at Minot, N. D., with Dr. A. M. Snell, Rochester, Minn., presenting a paper on "Sprue." The usual fine dinner was served.

The Glacier County Medical Society is being organized and will ask for a charter from the Montana State Association for membership. Drs. Nerall, Olsen, Schrader, Saylor and Liest are in charge of the active work.

Col. C. A. Neves, manager of Battle Mountain Sanitarium, S. D., for the past four years, has been transferred to Washington, D. C., where he will become chief of administration and operation of the Division of National Homes.

Dr. Geo. Lowe of Marshall, Minn., is moving to Belle Fourche, S. D., and takes over the office of Dr. C. E. Whiting and Dr. Whiting is moving to Marshall and will take over the office of Dr. Lowe. The change will be made this month.

Dr. Jared W. Daniels, the well known and beloved physician of St. Peter, Minn., passed away last month, after a brief illness. Dr. Daniels was deeply interested in military and church work, and will be greatly missed by a large circle of close friends.

Dr. J. A. Myers, Minneapolis, was the guest speaker at the monthly meeting of the Wapello County Medical Society, at Ottumwa, Iowa, on October 16th. His subject was, "Modern Aspects of Diagnosis, Treatment and Prevention of Tuberculosis."

Dr. Harold S. Diehl, Director of the Students' Health Service and Professor of Preventive Medicine of the University of Minnesota, was the guest speaker of the Monroe County Medical Society, Rochester, on October 16. The subject of discussion was "The Common Cold."

Dr. J. D. Carr, superintendent of Hospital for the Insane at Jamestown, N. D., reported an overcrowding of patients at his institution, and this holds good for nearly every Northwestern state. Dr. Carr will urge the coming legislature to provide funds for a new Men's Dormitory.

George B. Larson, St. Paul, has been named to the newly created position of medical field representative for emergency medical relief for the Minnesota State Medical Association. Mr. Larson has for the last six years been executive secretary of the Polk County Medical Society, Frederic, Wis.

The regular meeting of the Minnesota Academy of Medicine was held on the evening of November 14th. After dinner being served, two papers were presented, one by Dr. Frank E. Burch, on "Surgical Treatment of Retinal Detachment," and "Hyperthyroidism in Children," by Dr. Martin Norland.

The Yellowstone Valley Medical Society, at their recent annual meeting at Laurel, elected Dr. T. R. Vye, president; Dr. H. H. Culbertson, vice president; Dr. P. E. Griffin, treasurer, and Dr. O. C. Rathman, secretary. Dr. Hitchcock, Great Falls, was the guest speaker, presenting a paper on "Gastric Analyses."

Dr. Jared W. Daniels, who has been in active practice at St. Peter, Minn., for over forty years, died very suddenly last month from a heart attack. Dr. Daniels was a graduate of Rush Medical College, and was prominently connected with the military affairs of Minnesota, being made a colonel of one of the state regiments.

The monthly meeting of the Clay-Becker County Medical Society was held at Lake Park on November 2nd, the following program being presented: Dr. J. A. Myers, "Diagnosis, Treatment and Prevention of Tuberculosis"; Dr. H. S. Diehl, "The Common Cold"; Dr. R. V. Ellis, "The Diagnosis and Treatment of Hay Fever."

The Wright County Medical Society held their annual meeting at Buffalo, Minn., and elected the following officers: Dr. W. E. Hart, Monticello, president; Dr. V. P. Johnson, Delano, vice president, and Dr. J. J. Catlin, Buffalo, secretary. After the election was held, a banquet was served, with a general discussion of medical problems following.

With one hundred members present, the Hennepin County Medical Society honored Dr. Elizabeth A. Woodworth, recently retired bacteriologist in the city health department. Dr. J. Frank Corbett, head of the public health laboratory when Dr. Woodworth became a city employee 31 years ago, presented her with a silver plate on behalf of the society.

The list of hospitals that were approved in South Dakota are St. Luke's, Aberdeen; St. Joseph's, Deadwood; Veterans, Hot Springs; Sprague, Huron; Homestead, Lead; Community, Madison; Methodist and St. Joseph, Mitchell; St. Mary's, Pierre; Black Hills and St. John's, Rapid City; McKennan, Moe and Sioux Valley, Sioux

Falls; Bartron and Luther, Watertown; Peabody, Webster; Sacred Heart, Yankton.

The Southwestern Minnesota Medical Society met at the Sanatorium, Worthington, Friday, October 19th. The following speakers were on the program: Dr. E. A. Meyerding, St. Paul, Minn., "What Will Tomorrow Bring?" Dr. F. J. Savage, St. Paul, Minn., "The Work of the State Medical Society." Dr. Henry Meyerding, Rochester, Minn., "Fractures." Dr. C. B. Wright, Minneapolis, "Coronary Thrombosis." Dr. J. A. Myers, Minneapolis, "Chests."

The Minnesota State Medical Association broadcasts weekly at 10:45 o'clock every Tuesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters). Speakers: William A. O'Brien., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of November will be as follows: Novemebr 20—"Progress in Public Health"; November 27—"Warts and Moles."

A joint meeting between the Eastern Montana Medical Association and the Northeastern Montana Medical Association was held at Circle, last month with 30 members being present. Drs. Coggswell of Helena, Attix of Lewistown, and Drs. Vidal of Galen and Balsam of Billings, president and secretary of the State Society were guests. The total mileage of those attending was 3,965 miles one way, or an average of 36.7 miles per man. Following a splendid banquet the program was as follows: Movie, "Physiology of Fertilization," compliments of Meade Johnson & Company, Evansville, Ind. "Gangrene of the Omemtum with Recovery," case report by Dr. E. N. Jones, Wolf Point. "Tularaemic Pneumonia," by Dr. M. D. Winter, Miles City. A talking movie picture by Dr. Joseph B. De Lee, Chicago, on "Forceps Delivery."

Dr. Esmond R. Long, Director of the Laboratory of the Henry Phipps Institute for the Study, Treatment and Prevention of Tuberculosis, and Professor of Pathology at the University of Pennsylvania, will be the guest speaker at the annual meeting of the Minnesota Public Health Association to be held in the Twin Cities, Friday, November 23. He will discuss the latest developments in research work on the problem of tuberculosis at the annual dinner to take place at the Nicollet hotel at 6:30 p. m. Dr. Long was Professor of Pathology at the University of Chicago for several years before going to Pennsylvania. He has been a member of the Board of Directors of the National Tuberculosis Association for some years, and received the Trudeau medal of the association in 1932. Among the sponsors of the annual meeting are the Minnesota State Medical Association and the Hennepin County Medical Association.

In "Contact," a motion picture, with sound, which tells a dramatic story based on incidents from real life, the Hennepin County Tuberculosis Association has a new educational medium for its work in training the public to a more vigilant attitude against tuberculosis. This picture, which is said to be the first of its kind ever made anywhere, shows what happens in a typical American family when a tuberculosis-spreader infects a child. The play takes on all of the suspense of a mystery drama as medical science attempts to locate the source of the infection. One after another, those who were in close contact with the child are eliminated, until finally the disease is located in a member of the family who was herself completely unaware of illness. The film, which was prepared under the close supervision of the Executive Medical Committee of the Hennepin County Tuberculosis Association, is now being shown to clubs, organizations and groups throughout Minneapolis and Hennepin County.

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The JOURNAL LANCET

Minneapolis, Minnesota
December 1, 1934

New Series
Vol. LIV, No. 23

A Gastro-Intestinal Clinic*

E. Starr Judd, M.D.
Albert M. Snell, M.D.
B. R. Kirklin, M.D.
Rochester, Minn.

WE HAVE been asked this morning to give a combined medical, roentgenologic, and surgical clinic on gastro-intestinal disease and through the co-operation of your program committee have been furnished with excellent clinical material. The first case will be presented by Dr. Long.

Case I: Chronic Cholecystitis with Recurrent Acute Colics

Presented by W. H. Long, M.D.

This patient, a man, aged 50, a banker, presented himself May 14, 1934, because of upper abdominal colics, having had five since Christmas. The attacks begin gradually, attaining maximum severity in one-half to one hour. The pain is in the midepigastrium, does not radiate, causes no nausea and no vomiting, and there is no residual nausea or tenderness. Four hours after the last attack he was hungry for his breakfast. He requires morphine and in addition the use of chloroform for relief of pain. There are no urinary symptoms with or following the attacks. There is no indigestion at any time between attacks. The appetite is good and bowels are regular.

During the time he was under observation he was seen in one of these attacks, which began at midnight and became very severe. Morphine, grains 1/4, was administered at 2:00 a. m. This gave no relief and after 30 minutes 1/100 grain of nitroglycerine was given, bringing prompt relief. During the past week he had two other attacks, but the nitroglycerine was without effect and he required the usual amounts of morphine and chloroform for relief. Just a few whiffs of chloroform from time to time were all that seemed necessary in addition to the morphine.

Past History. He had ureteral colic in 1930 and passed a stone, and other attacks six months and two years later. During the past winter he has had some substernal distress when walking fast on cold days or against the wind. During the summer he plays 18 holes of golf without discomfort; he is not conscious of any shortness of breath.

Examination. Teeth and tonsils are questionable. There is a right hydrocele; the heart is normal size, but the tones are of indefinite quality; the blood pressure is 126/96; otherwise, entirely negative. Complete neurologic examination is negative. Urinalysis is negative except for occasional erythrocytes and leukocytes; hemoglobin is normal; erythrocytes number 4,870,000 and leukocytes 6,150; Wassermann and Kahn reactions are negative; roentgenograms of the kidney, ureters and bladder reveal a small calcified area in the lower pole of the left kidney, also a small shadow near the left ischium, probably a phlebolith; Graham Cole gall-bladder roentgenograms showed

*Informal clinic presented at the Forty-seventh Annual Meeting of the North Dakota State Medical Association, Fargo, N. D., May 29, 1934.

poor concentration and an area in the base of the gall-bladder which is more dense than the remainder of the organ, suggesting deposit in this region. This was checked by an intravenous Graham Cole and the dense shadow seen in the first picture was not found. The gall-bladder was faint and concentration poor; diagnosis, pathological gall-bladder.

An electrocardiogram showed sinus rhythm and slight left ventricular preponderance. Because of the previous history of renal colic, cystoscopic examination and pyelograms were made which showed the questionable shadow to be outside the urinary tract. Because of the rather bizarre type of the attacks and the absence of any localized tenderness or digestive phases, spinal fluid examination was carried out to exclude the possibility of the gastric crises, and this was entirely negative.

Dr. Snell: This is a very interesting case from the standpoint of differential diagnosis. If in every patient suspected of cholecystic disease the diagnostic possibilities were considered as carefully as they have been in this case, we would have fewer unsatisfactory results following cholecystectomy. That we have unfavorable results is due, I think, to the fact that we have not segregated the types of cholecystic disease in which benefit can be given by operation. In this case one striking thing in the history is the acute onset of abdominal colic without any prodromal symptoms.

This man's trouble began with sharply localized epigastric pain, which did not radiate, but which was so severe as to require morphine and finally chloroform for relief. A number of factors have to be considered in differential diagnosis. For many years the man has had kidney stones and, of course, renal colic could closely simulate the pain he has had. We always have to keep the kidney in mind when abdominal pain of this sort is present, but in this case we can, for all practical purposes, exclude the kidney as a cause of the present complaint.

Coronary disease with angina pectoris is not so easy to exclude. The man has pain when walking against the wind on cold days, and on one occasion has been given nitroglycerine with some relief. In the next attack it did not help him. In angina the pain is almost always related to physical effort or to nervous stimulation, and only one of this man's attacks was definitely related to such factors. It is often difficult to evaluate the cardiac factor in pain such as this patient has suffered. It is not uncommon to encounter patients who have attacks that simulate angina and who have immediate relief following cholecystectomy.

The possibility of gastric crisis in this case has been satisfactorily excluded. The crises, pain, and vomiting of tabes dorsalis are usually identified by physical signs of syphilis of the central nervous system and also by serologic tests. In this instance the negative spinal fluid gives us further assurance. Dr. Hammes reminded me of one case in which a patient had supposed gastric crises for some time and had been treated for syphilis without noticeable effect. On one occasion jaundice developed after a severe attack, and on surgical exploration, stones were found in the common bile duct.

I think in this man's case we can say that we have ruled out a renal lesion and that gastric crises are eliminated. He may have coronary sclerosis as well as disease of the biliary tract, but I think operation will probably improve his condition considerably.

It is interesting to note in this connection that the disease one finds in the gall-bladder does not always fit in accurately with the symptoms described. Cholecystic disease of a purely inflammatory nature can, for example, give one about the same type of colic that occurs with stones. There is no satisfactory information as to the mechanism of pain originating in the gall-bladder.

There have been some interesting experiments carried out recently in an endeavor to produce biliary colic experimentally. Zollinger inserted balloons into the gall-bladder at laparotomy and later inflated them, with the idea that certain of the pre-operative symptoms would recur. His patients had some distress in the lower part of the chest and under the scapula, but not the typical radiating pain and colic of gall-bladder disease. Practically all of them vomited severely as long as pressure was maintained within the balloon, and many complained of respiratory difficulty. These experiments do not confirm the current ideas of the mechanism of biliary colic, but they do serve to explain the recurrent vomiting which may occasionally be the principal symptom of cholecystic disease.

Dr. Judd: This patient represents a very interesting clinical picture of gall-bladder disease. I believe that he has angina pectoris as well as a diseased gall-bladder. We have noted a very definite association between conditions of the biliary tract and cardiac pain and are at present trying to analyze the relationship between these conditions. In the early years we used to think that, if patients had coronary disease and chole-

cystitis, we had better carry them along on morphine and not operate at all. We finally operated on several such patients and found that we not only relieved the disease of the biliary tract by removing the gall-bladder, but that we also relieved many of their anginal seizures. Willius says that 53% of the patients who have disease of the biliary tract and angina pectoris are relieved symptomatically by cholecystectomy. That does not mean that they are cured, but many of them have fewer and less severe attacks, or even complete symptomatic relief. Relief is also obtained in cases of myocarditis and endocarditis; therefore, we have changed our viewpoint completely, and we now feel that we can help such patients a great deal. We followed this group of patients carefully under the supervision of a cardiologist and have lost only one patient from post-operative cardiac failure.

There are other aspects of disease of the biliary tract which are poorly understood, particularly the possibility of the gall-bladder acting as a focus of infection. For some years Dr. Hench and I have been working on the relation between disease of the gall-bladder and arthritis, and we find that we sometimes cure rheumatism by taking out a diseased gall-bladder. It is interesting that pain of joints will disappear entirely following cholecystectomy and remain absent two or three weeks. After this period the pain usually recurs. We have cultured the gall-bladder at operation and have inoculated animals with the material, producing definite infectious arthritis in some instances. I think there is a definite focal relationship between cholecystic disease and arthritis if we can work it out.

It is hardly necessary to comment on how little we know about biliary disease. Dr. Snell says we know nothing about what produces the pain. The etiology of cholecystitis is even more obscure. Several years ago I routinely cultured the gall-bladder in an effort to find out what organism was producing the disease and found that about 50% of cultures were sterile. Evidently not all cholecystic disease is of an infectious nature. This raises the question of a metabolic disturbance involving the functions of the gall-bladder, particularly in respect to its concentrating power; the strawberry gall-bladder probably belongs in this group.

If you want to produce cholecystitis in an experimental animal you cannot do so routinely by injecting pathogenic organisms. If you inject lysol or Dakin's solution intravenously you may produce a thickened, definitely diseased gall-bladder wall, with marked edema. Histologically, the changes are the same as those seen in subacute or acute cholecystitis. The interesting thing that occurs when these chemicals are injected into the circulation is that none of the other body tissues are affected at all. From the standpoint of etiology we probably have the types of cholecystic disease that can be produced by bacterial invasion. We have a metabolic type characterized by the strawberry gall-bladder and possibly a chemical type also. There is also a type of case, so far unclassified, with all the symptoms of disease of the biliary tract, including colic, that often requires morphine for relief. The surgeon may operate on such a patient, expecting to find definite cholecystic disease and find only minor pathologic changes in the gall-bladder. In certain cases in which the symptoms are perfectly definite we often do not find any striking anatomic change. The converse of this is also true. We operate occasionally on patients with indefinite abdominal symptoms and find a thick and edematous gall-bladder. I believe the clinical picture of cholecystic disease is the most important thing to keep in mind. Operation is usually done on the basis of a clinical history and findings, very often with definite relief of the symptoms. However, if we proceeded on this basis alone we would undoubtedly remove a certain number of normal gall-bladders. I think a great many problems in this connection are still to be analyzed.

To return to the case which Dr. Long presented, the patient was operated on this morning by Dr. Weible, who will report the findings.

Dr. R. E. Weible (exhibiting specimen): The liver had a rather unusual color throughout. In the right lobe there was an indefinite portion that, on palpation, was fairly hard. In the gall-bladder fossa was a fan-shaped area of hepatitis. The gall-bladder itself felt empty but, on opening it, we found some concentrated black bile. The walls are inclined to be somewhat edematous and friable. Within the gall-bladder was one very definite papilloma.

Dr. Judd: In regard to papilloma of the gall-bladder, the principal recent development has been their identification by cholecystography. We know very little about their clinical manifestations. Caylor and Bollman have found out that papillomas are often associated with great concentrating capacity. The question of whether papillomas are the beginning of malignancy is another problem. Carcinoma of the gall-bladder, I think, is almost hopeless when it gets to the point at which it can be recognized clinically, and

when this point is reached it is better to leave the patient alone than to operate.

Case 2: Stone in the Common Bile Duct

Presented by W. A. Stafne, M.D.

A white woman, aged 56, presented herself April 14, 1934, complaining of pain in the right upper abdominal quadrant and loss of weight of five weeks' duration.

Intermittently, in the last 14 years, she had had severe attacks of pain in the right upper quadrant, radiating into the back, across the upper part of the abdomen, and into the region of the right shoulder blade. These attacks would last from three to four hours and always had required hypodermic injections of morphine for relief.

March 5, 1934, five weeks before her admission to the hospital, she again had had an attack of acute colicky pain, very similar in character to those which she had previously experienced. Several hypodermic injections of morphine had been required for relief. Since then there had been almost constant, dull aching pain and soreness in this region, which necessitated some sort of hypnotic constantly. There was considerable nausea, but no vomiting, chills or fever. Loss of weight was about 25 pounds. During the weeks prior to admission she had noted that her urine had had the appearance of coffee, but she had never noted the character of her stools. The day before admission the physician at her home had discovered that she was becoming jaundiced. At no time had there been any symptoms of dyspepsia.

Physical examination revealed an extremely poorly nourished, dehydrated, jaundiced woman, with evidence of considerable loss of weight. The rest of the physical examination gave essentially negative results, except for absolute irregularity of the heart beat, with a pulse deficit of 20, and tenderness, with rigidity graded 1, in the right upper quadrant. The blood pressure was 164/90.

The value for hemoglobin was estimated at 80%; erythrocytes numbered 6,200,000, and leukocytes, 14,000 for each cubic millimeter of blood. Urinalysis gave evidence of diacetic acid graded 2 and bile graded 1. The blood urea, blood sugar, and blood sedimentation tests all gave results that were within normal limits. The value for serum bilirubin, which gave a direct reaction, was found to be 6.7 mg., 10.4 mg. and 8.9 mg. per 100 c.c. respectively, at intervals of two days prior to operation. The stools were positive for occult blood, but negative for bile, urobilin, and urobilinogen on two occasions. Gastric expression gave evidence of absence of free hydrochloric acid, and duodenal drainage was negative for bile and blood. The electrocardiographic findings were as follows: Rate 150, auricular fibrillation, slurred QRS complex in leads I, II, and III, and inverted T wave in leads II and III. The basal metabolic rate was +7%.

After pre-operative preparation, consisting of glucose and calcium intravenously, and a blood transfusion, the patient was operated on 12 days after admission. A large edematous gall-bladder was found to be filled with a mixture of black and of white bile. It contained one stone of the mulberry type, measuring 1.5x1.5 cm. Another stone was situated at the juncture of the cystic and the common ducts (1 cm. by 0.75 cm.), causing complete obstruction of the common duct with dilatation to the size of the index finger above the point of obstruction. The stone was pushed back into the gall-bladder and the latter drained through a dressed tube for 14 days. Following removal of the tube, bile continued to drain from the gall-bladder for seven more days. The jaundice disappeared after ten days of drainage, with complete recovery of the patient. She was dismissed 24 days after operation.

Dr. Snell: This is very nearly a classical history of a case of stone in the common bile duct. The patient had a great many attacks of biliary colic and finally got one attack from which she did not recover. She still shows evidences of having been through a severe illness. She said that in the last attack, pain seemed lower in the abdomen than previously, and that pain and tenderness were continuous.

The classical case of choledocholithiasis does not, as a rule, present much difficulty in diagnosis. Following biliary colic, there is a brief episode of jaundice, chills, and fever, with spontaneous improvement after a few days. Stones rarely occlude the common duct completely or permanently and, therefore, the hepatic injury which takes place during a period of obstruction has an opportunity to be repaired in the intervals between attacks.

Cases may be atypical in respect to pain, both as to character and situation; they may be atypical because of the degree and permanence of obstruction, and finally the element of hepatic injury may greatly alter the clinical picture. We have learned to be liberal in our interpretation of what constitutes biliary colic.

We saw one woman recently who had all the pain in the left upper part of the abdomen. The appearance of jaundice established the diagnosis. We also see a few patients who have lower

abdominal pain. One patient on our service had colicky pain confined entirely to the left lower quadrant, pain which was so severe that exploration of that region was considered. Finally a little jaundice developed, and Dr. Judd, with some trepidation, opened the common duct and removed a mass of stones, with complete and lasting relief. We also find people who have nothing in the way of pain that can be classified as colic and yet have stones in the common duct. We saw a man recently with deep jaundice and no history of any pain. The clinical picture was that of malignant growth obstructing the bile ducts. We watched him for a few days and noted one sharp drop in the value for serum bilirubin. On account of this, operation was advised and a stone was found in the common duct and removed.

The hepatic lesions which follow biliary obstructions are also variable. If one ties the common bile ducts of a series of dogs, the injury to the liver varies greatly. Some patients tolerate biliary obstruction well and have permanent injury to the liver, whereas others have definite changes of a much more severe degree. These hepatic parenchymal lesions may range from subacute atrophy to chronic hepatitis and cirrhosis, and in some instances the picture of hepatic injury completely overshadows the element of biliary obstruction. In such individuals diagnosis is extremely difficult.

I think the patient in question has only a moderate amount of hepatic injury, from which she will recover completely, and within a few months will be better than she has been for a long time.

Dr. Judd: The case Dr. Stafne has reported is very interesting. One thing that has improved our results in operating on the common duct is to provide drainage for a long time. Some surgeons have felt that the common duct might be closed without drainage after the removal of stones. I think this is wrong. If there is definite hepatitis, I think the best procedure is to put in a tube and leave it there for a month. The T tube gives absolute control of the bile and allows the biliary infection to clear up. I believe the best plan in these cases is to provide drainage over considerable periods of time, depending on the amount of hepatic injury and the degree of infection.

Gastric Ulcer

Dr. Snell: Dr. Judd has emphasized the many shortcomings in our knowledge of disease of the biliary tract. To go from that to peptic ulcer is just a step downward, for if we know little about disease of the biliary tract, we certainly know less about peptic ulcer. To begin with, it is an extremely common condition. We know that 20% of patients examined at necropsy show past or present evidence of peptic ulcer. This figure is so high that it almost seems incredible, since only a small fraction of these individuals have ever been conscious of the presence of such a lesion, but pathologists agree that about one person of five has it.

There are many different opinions about etiology. First, in order of importance, is the old theory that the hydrochloric acid of the gastric juice digests the gastroduodenal mucosa and forms a chronic ulcer. There is a good deal of merit in this idea for, clinically, there are practically no ulcers without free hydrochloric acid in the gastric juice. A second explanation is based on the fact that the gastric arteries are end-arteries, and that occlusion of such vessels may produce unusual infarction. This is probably not a common condition, but it may explain some of the ulcers seen among older persons who have marked arteriosclerosis. A third theory concerns itself with autonomic imbalance. We assume that vagal activity is involved, although the mechanism is unknown. The question of infection has been considered, and there is no doubt that many ulcers do follow infections in various parts of the body. Traumatic ulcers are also definitely known. Constitutional predisposition is another important factor.

The thing we would like to know is where all the gastric acid goes. In the dog the hydrogen ion concentration of gastric juice is about 1.2; if you obtain specimens three inches further along in the duodenum the hydrogen ion concentration is about that of tap water. If we knew what absorbs the hydrochloric acid in this fashion and what disposes of it in so limited an area, we would know why we can cure some people of peptic ulcer and why others have intractable lesions. I think the matter of physiologic neutralization of acid may hold the key to the whole situation.

The clinical cases to be presented emphasize the fact that ulcer occurs at all ages and that the symptoms and the severity of the disease vary tremendously with different patients and at different times in the same patient. Ulcer is a lifetime problem, insofar as the tendency to formation of ulcer probably persists to a variable degree throughout the life of the affected individual.

Case 3: Duodenal Ulcer

Presented by W. H. Long, M.D.

The patient is a girl, aged 17. Her father is living, but has severe Buerger's disease; her mother is living and well. Three brothers and three sisters are living and well. The patient has had pertussis, measles, and German measles; she also had diphtheria at one year of age, and left serofibrinous pleurisy in 1932. She sustained a fracture below the left elbow at the age of six, and a fracture above the right elbow at the age of ten. Her tonsils were removed in 1933. Soon after Christmas, in 1933, the patient first noted pain in the right lower part of the abdomen, which she thinks was worse after eating and which has been much worse during the last few weeks. The pain has no connection with menstruation; her last period of flow was three weeks ago. She complains of some constipation.

Examination on May 11, 1934, revealed slight tenderness in the right lower part of the abdomen. The examination was negative otherwise. The patient was given mineral oil and was asked to report developments. She returned May 25, when the history was retaken. The bowels were in better condition. She said she noticed that if she exerted herself the pain would appear and would last from a half hour to one hour. Later this pain came on even at night. She thinks the condition has been worse following an injury received about Easter, and she believes that change of position aggravates the condition. The pain is not so severe in the morning. She eats breakfast about 7:15, goes to school, and feels all right until her second class at 9:15 a. m., when the pain comes on. Usually, after she eats her lunch at school at 12:00 o'clock, she feels better, but at about 2:00 p. m., in the course of a study period, the pain comes on again. Sometimes the nurse has sent her home from school. Supper, at about 7:00 p. m., usually causes disappearance of the pain, but at about 9:00 p. m. it comes on again and is troublesome until about midnight. During the last week the pain has been more pronounced in the pit of the stomach, and she has obtained no relief with the taking of sodium bicarbonate.

Examination revealed tenderness under the right costal margin and in McBurney's area. The blood pressure is 100/62; the pulse rate is 66; the temperature is 97° F. at 5:00 p. m. Urinalysis revealed a specific gravity of 1.009, a strongly acid reaction, a faint trace of albumin, no sugar, and an occasional leukocyte on microscopic examination. The value for hemoglobin was 75%; erythrocytes numbered 4,200,000, and leukocytes 7,600 per cubic millimeter of blood. Analysis of gastric content after an Ewald test meal disclosed total acidity of 40 units and free hydrochloric acid of 24 units, with a total quantity of 145 c.c. Roentgenologic examination revealed an irregular duodenal cap, which filled poorly.

Dr. Snell: This is, of course, a rather irregular history of ulcer, but recently the symptoms have been more definite and have assumed the usual sequence so commonly noted in cases of duodenal ulcer. The persistence of pain in the region of the appendix, made worse by change of position and exertion, raises the question of associated subacute appendicitis. Roentgenologic examination reveals a deformed duodenal cap. So far as treatment is concerned, I think Dr. Judd agrees that she should be treated medically until we find out what can be accomplished. Operation on so young a patient should be deferred until medical measures have been given a thorough trial.

Case 4: Duodenal Ulcer

Presented by W. H. Long, M.D.

The past history of this patient, a woman, aged 50, is unimportant except that appendectomy and hysterectomy were performed when she was 43 years of age. In June, 1927, the patient consulted me, stating that she had had stomach trouble for two years; it was characterized by gnawing and burning sensations that came on two to three hours after eating and which lasted for two hours, or until food was taken. Coarse food, especially salads, apples, grapefruit, and prunes, disagreed with her. She had had nausea for the preceding two weeks, and pain awakened her about 1:00 to 2:00 a. m. Definite remissions and exacerbations of these symptoms had been noted. Her appetite was good and her bowels had been kept regular with the aid of mineral oil. There was no history of colic and no melena. In July, 1927, she spent three weeks in the hospital under Sippy management for ulcer. This brought about complete relief and she went home in the fourth week of treatment on an ambulatory diet.

In April, 1928, she reported that she had been very strict with her regimen and had had no further burning, gnawing, or nausea, but that during the preceding ten days she had been conscious of her stomach at times, and one day she had found a sore spot in the right upper part of the abdomen. On one occasion during the spring of that year she had noted sour eructations.

In May, 1934, the patient reported that she had been having some flatulence during the last two or three years, but had had no more of the

old gnawing and burning ulcer pain. Almost as soon as food was taken she felt like belching and had an "empty feeling" about 10:00 a. m. and 3:00 or 4:00 p. m. She had frequently been awakened by vague epigastric pain about 2:00 a. m. which was relieved by taking a glass of milk or an alkaline tablet. She had had salivation occasionally and sometimes had induced vomiting, with complete relief. The vomitus was usually only liquid, but once she saw food that had been taken four hours previously.

Laboratory findings, with the exception of those that follow, were not significant. Analysis of gastric content after an Ewald test meal, June 14, 1927, revealed total acidity of 82 and free hydrochloric acid of 54 units. April 10, 1928, total acidity was 76 and the free hydrochloric acid was 34 units one hour after breakfast. April 13, 1928, total acidity was 58 and free hydrochloric acid was 12 units one hour after dinner. On roentgenologic examination, June 14, 1927, a duodenal deformity, characteristic of ulcer, was noted; this deformity was less pronounced on May 24, 1934. Cholecystography showed a round shadow in the fundus of the gall-bladder, suggesting a gall-stone. The gall-bladder showed good concentration, but did not empty. May 25, 1934, there was fluoroscopic evidence of an old duodenal ulcer; a definite deep crater was noted, suggesting the possibility of a perforating lesion.

Dr. Snell: I think we will have to admit that medical management did not give this patient complete relief except in the earlier years of her trouble. She did not at first have enough trouble to warrant surgical intervention. Why does she have symptoms at present? I inquired as to whether she had been under any unusual strain or had had an infection of the upper part of the respiratory tract, or anything of that kind. There is now some cholecystographic evidence of disease of the gall-bladder, and I think that this may explain the present exacerbation. Certainly we will have to look with some suspicion on her gall-bladder, although she is still sufficiently well to warrant further medical treatment for the ulcer. The roentgenologic evidence of formation of a crater is a little disturbing, but conservative management is probably the best course for the immediate future.

Case 5: Ruptured Duodenal Ulcer; Acute Appendicitis; Cholelithiasis

Presented by A. C. Fortney, M.D.

J. G. J., a man, aged 26, single, salesman, came to my office on April 6, 1934, complaining of terrific pain in the abdomen. This pain came on suddenly at 2:00 p. m. He described it as a sharp, stabbing pain in the epigastrium that gradually spread over the entire abdomen. The pain was so severe that the patient could hardly bear the weight of clothing on his abdomen. There was no nausea or vomiting.

Past History. At the age of six, the patient had what the doctors called a nervous indigestion. Whenever he became excited, he got cramps; this persisted until he was 12 years of age, and then it disappeared and he seemed to be perfectly well until the age of 15. At this time he became troubled with dizzy spells. These would last two weeks at a time and were invariably associated with constipation. He had these spells until he was 22 years of age. From that time until the present date, his bowels have been regular.

Three weeks ago the patient noticed a sensation of a lump in the pit of the stomach. There was no pain or ache, but he felt like belching gas, although he did not. This did not disturb him at night. Food did not improve it any, and he took no soda. Cathartics gave no relief to epigastric discomfort, but made the bowels move.

Two years ago in August, 1932, the patient had an attack very similar to the present one. He was suddenly seized with severe pain in the abdomen, and he was taken to St. John's Hospital where he was seen by Drs. Kent Darrow and W. H. Long. Although the idea of an acute intra-abdominal accident was entertained, because of the fact that he was working in a printing office at the time, lead poisoning was suspected. A smear of the blood cells showed about one basophilic stippled red cell to every five fields. By means of hot packs and sedatives the attack subsided, and he left the hospital in about one week.

Examination. The patient is an asthenic white male who appears acutely ill. He has an anxious expression on his face. The skin is pale, and he is perspiring profusely. The eyes, ears, nose and throat are negative. The heart is negative. Blood pressure, 110/70. Pulse, 76. The abdomen is flat, muscle guard +4, and he complains bitterly of pain when palpated over the epigastrium and over McBurney's area. Muscles are so rigid that no masses are palpable. The rectal examination is negative.

On admission, leukocytes were 10,000. Three hours later, the leukocytes were 18,000. Urine was negative. A blood smear for basophilic stippling was negative.

Operation was performed six hours after onset of the attack. A ruptured duodenal ulcer was found, the opening closed with purse string

suture. An acutely inflamed appendix was found and removed. The abdomen was closed without drainage. The patient made an entirely uneventful convalescence.

There was no elevation of temperature, and the pulse never went over 84. An electrocardiogram taken three days after operation was entirely normal. The patient left the hospital on the fourteenth post-operative day.

A roentgenogram of the stomach on May 21, 1934, revealed a persistent deformity of the cap. The patient was entirely free from pain or any gastric symptoms.

Dr. Snell: This is a clear story of a perforating ulcer, one which illustrates the fact that ulcers perforate unexpectedly. The original illness, thought to be due to plumbism, could easily have been due to an inflammatory peptic ulcer that was on the verge of penetration. It is interesting to note that some individuals retain throughout their whole ulcer history this tendency to penetration or perforation, whereas others in whom this tendency is absent, have large, callous, and very chronic ulcers. We see, as a rule, the chronic type of peptic ulcer at Rochester, but abroad a much larger percentage of the perforating lesions is noted. Perforations are much more common in industrial communities and large cities than in rural districts. The Germans comment on this and it is shown in statistics from various clinics.

Dr. Judd: I think this group of cases shows clearly certain of the medical and surgical aspects of the ulcer problem. In the case of the girl aged 17, I would not advise operation now; she should have further medical treatment before a final decision is made. She should be hospitalized on strict management, probably for two weeks when she could be allowed to go home and continue on ambulatory management of ulcer. In her case, the question of associated appendicitis cannot positively be decided now; further observation undoubtedly will settle the matter. If we are going to operate on young persons, we must not perform gastrojejunostomy or gastroenterostomy. In the last year there have been some new developments along this line, and a new type of surgical procedure has been tried which consists of joining the stomach laterally to the duodenum. The important feature of this operation is that we do not interfere with normal gastric physiology. The acid content of the stomach passes directly into the duodenum just as in the normal subject, but sphincteric activity is abolished.

The operation of gastroenterostomy has been criticized because of the development of gastrojejunal ulcer. Just how frequently jejunal ulcer occurs, I do not know. The patient may be well for years and then a jejunal ulcer may develop. I think this new method of joining the stomach laterally to the duodenum, when it can be done (and I think it can be done much more often than we formerly believed), is a logical procedure in duodenal ulcer. Wilkie, after joining the stomach to the duodenum, makes a further connection to the jejunum and feels that he has accomplished a great deal.

In the case of the woman who was a little overweight, one would perhaps be justified in performing gastroenterostomy. However, there is an objection on the grounds of the enormous amount of omental and mesenteric fat that would be encountered, which would make a constant pull on the anastomosis. A well-functioning gastroenteric stoma cannot always be made under such circumstances. I think she still presents a medical problem and should be kept under observation on that basis.

The boy who had the perforated ulcer brings out the problem of whether one should perform gastroenterostomy when closing the perforation at the time of operation. There was, at one time, a great deal of controversy about this between Deaver and others. I think it depends a good deal on the condition of the patient at the time of operation, and one still has to consider the question of the subsequent development of a gastrojejunal ulcer. We want to avoid stomal ulcers if possible, and the best way to cure them is not to allow them to form. Usually a jejunal ulcer will not respond to medical treatment. If we are going to operate for such ulcers, and we are obliged to do so a great many times, the question comes up as to whether we want to follow the plan of the surgeons at Mt. Sinai Hospital, New York, and perform subtotal gastrostomy, or whether we want to take down the gastroenterostomy, reconstruct the pyloric region, and leave the patients as they were. We usually take down the gastroenterostomy, which removes the jejunal ulcer, and then perform lateral anastomosis between the stomach and duodenum. I think that some such procedure will be the ultimate solution of the problem.

Roentgenologic Interpretation

Dr. Kirklin: Peptic ulcer is a subject that roentgenologists are vitally interested in, for they feel that this is one of the fields in which they have definite information. I would like to review with you some of the types of duodenal ulcer.

(Slide) It is rather unusual, although not

impossible, to find an ulcer in a duodenum that is as smooth and well filled as this one. On the right you see the deformity typical of duodenal ulcer. It does not necessarily mean that an active ulcer is present, but it means at least that the patient has had at some time a duodenal ulcer, for a healed ulcer also produces deformity.

(Slide) This represents a type of duodenal ulcer that can easily be overlooked. Probably 95% of duodenal ulcers are in the first one and one-half inch of the duodenum; so if the duodenal cap appears to be normal, with no evidence of a crater, the examiner may be inclined to exclude ulcer. However, duodenal ulcers do occur two or three inches out in the duodenum and they should be kept in mind.

(Slide) This woman had been examined two or three times for duodenal ulcer, but none was found. Finally we were able to see a small crater, but at operation it was necessary to open the duodenum before the ulcer could be found. I think if a roentgenologist discovers a crater he is justified in insisting that the surgeon open the duodenum.

(Slide) Here is a normal looking duodenal bulb. Often large duodenal ulcers do not produce any deformity of the bulb. The reason for this is that small, active ulcers produce spastic distortion and this is what is seen, whereas, in these large ulcers, unless one compresses the duodenal bulb, the crater of the ulcer will not be observed. In this case the ulcer would not have been discovered without compression.

I feel that the recognition of duodenal ulcers by the roentgenologist should be 100% accurate, but unfortunately it is not, at least in our hands. Occasionally the examiner overlooks evidence of ulcer, but the ratio of errors should not be greater than 3% or 4%.

I think there are several reasons why this high degree of accuracy has been obtained. At the beginning, pioneers attempted to interpret the roentgenologic findings as they saw them on the screen and film, later correlated them with clinical and surgical data, and profited by the errors they had made. I hold that the roentgenologist should still be considered a consultant, but I feel that if he is given the clinical history, he is likely to allow it to influence the diagnosis. The men who have advanced roentgenologic work in this country have approached it from that angle, and I think that is why the work surpasses that on the Continent. There they endeavor to fit clinical and roentgenologic evidence together, and they sometimes fail to make the diagnosis.

(Slide) I show this picture because of the similar case that was presented this morning. This patient came to the clinic and, when sent down to the section on roentgenology, the physician sent a note stating that there were clinical data suggesting perforation two weeks before but that the patient recovered very rapidly, and we were asked to use caution in handling. For that reason we made this roentgenogram. You notice the fransradiant space near the diaphragm indicative of air between the diaphragm and liver. That means just one thing, in the absence of recent laparotomy, and that is recent perforation of a hollow viscus. Needless to say, this patient was not given barium meal.

(Slide) One other point in connection with the differential diagnosis of peptic ulcer, and this is the point that Dr. Judd has emphasized in detail, duodenitis. We reviewed a series of cases in which the roentgenologic diagnosis had been duodenal ulcer but in which Dr. Judd found only duodenitis. From this review it was learned that, in duodenitis, the deformity is variable, the duodenum is very irritable and spastic, and that it empties quickly; it retains the barium only momentarily. This review first gave us definite conception of the roentgenologic signs of duodenitis, and now we feel that in certain cases a definite roentgenologic diagnosis of duodenitis can be made.

As to cholecystography and its value, I think the thing you are interested in is, what dependence can be placed on the report following the examination. I would like to show you a few slides of typical cases before we discuss the question of accuracy. The technic we have found most satisfactory with the oral method is the one we are using at The Mayo Clinic. The two important factors in this technic are the meal, which the patient takes prior to taking the dye, and the time at which the patient takes the dye. I am convinced that the best results are obtained if the patient is told to eat the usual evening meal, eliminating fats as much as possible, and then take the dye immediately after the meal. The dye should be given in grape juice, because it seems to disguise the color and taste of the dye better than anything else, although it may be given in orange juice or in ginger ale. We have to remember that cholecystography is a test of gall-bladder function; that is, of the ability of the gall-bladder to concentrate and expel the dye. When the oral method is used, we have to allow for wide latitude in what constitutes a normal cholecystographic response.

If a report of malfunctioning gall-bladder or of gallstones is received, what are the chances

of that patient's having a diseased gall-bladder with or without stones?

(Slide) I here present a statistical summary of the work at the clinic during 1932, covering all cases in which cholecystographic examination was followed by operation at which the gall-bladder was explored and, if necessary, removed. Taking first the group of cases of normally functioning gall-bladder, the group in which cholecystographic diagnosis is least reliable, there may be definite disease of the mucosa and yet enough mucosa may be left to concentrate the dye and produce a perfectly normal shadow. In such cases the cholecystitis may be of grade 1, 2, or 3, not often of grade 4. In 10.5 per cent of these cases in which normal function was reported, definite disease was found at operation.

A comparatively small number was reported as poorly functioning, but gall-stones or cholecystitis, or both, were found at operation in 94.8 per cent of these cases.

There were 106 cases in which a report of nonfunctioning gall-bladder was made. Stones were not visualized. In 97.1 per cent of these cases there was definite cholecystitis at operation. Stones were found in 84.9 per cent.

Gall-stones were reported in 294 cases, and in only one of these cases were the stones not found at operation, an accuracy of 99.6 per cent.

Positive cholecystographic data were obtained in 445 cases in which the patients came to operation. There were six errors, or an accuracy of 98.6 per cent.

The entire group is comprised of 732 cases in which cholecystographic diagnosis was made; in 696 of these the diagnosis was confirmed at operation, a cholecystographic accuracy of 95.0 per cent.

The dye was given orally in all cases. I hope the summary gives you a fair idea of the reliability of this method of diagnosis.

Now we look at the films in case 1 of those which were presented today. The thing I am especially interested in is that we have a gall-bladder which is able to concentrate the dye. In other words, there is present sufficient normal mucosa to concentrate the dye and produce a normal shadow. You see a faintly dense shadow at this point (indicating on film). Slight movement will wipe out these shadows in many instances.

I would suspect that the surgeon would find a fairly good-looking mucosa in this gall-bladder, although there is some evidence of disease, but he also should find some very thick, ropy, sandy bile lying in the fundus of the gall-bladder. This shadow is characteristic of a small amount of inspissated material.

Fractures of the Spine*

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IN PRESENTING this further study of the decompressing of compressed fractures of the spine by means of the "jack" we have the double purpose of calling this rather simple and we think efficient method to your attention and of giving to you our personal experience in its use. The material on which this present study is based is a series of 78 compressed fractures of the spine without cord symptoms occurring in 4,172 fractures seen by us between January 1, 1924, and January 1, 1934. In this series there are 432 fractures of the spine including compressed, fractures of the pedicles and lamina and all other bony injuries of this organ. Of this series of 432 spine fractures 78, or approximately 19 per cent, were the pure compressed type without cord damage and they comprise about 1.8 per cent of all fractures seen, these being observed in an average community in which industry and agriculture play an equally important part. We were struck, however, by one interesting factor in running through this entire series of spine fractures in that in the five-year period between 1924 and 1929 the percentage of compressed fractures to all spine fractures was considerably more than it is at the present and we find further that in analyzing our spine fractures a great many of the injuries occurring in the past three or four years since the advent of the high-powered, high-speed automobile have been of much more grave nature than the spine fractures occurring previous to this time.

I do not want to annoy you with the historical aspect of this injury with which you are all as familiar as I am. As you know, very little is seen in literature about compressed fractures of the spine prior to about 1915. X-ray equipment existing before that date was not sufficiently good to allow lateral X-ray studies to be made without which compressed fractures must remain a somewhat obscure subject. Kummel[1] in his rather remarkable treatise in 1895 described a wedging of the vertebra in the back which he thought followed injury and which he thought to be an absorptive osteitis somewhat similar to a Perthe's disease and did not recognize as a compressed fracture. Text books on fractures prior to 1920 made little mention of this injury and in fact text books prior to 1930 did not give it nearly so prominent a place as it probably deserves. In 1917 Hartwell[2] and later Brackett[3] reported a series of cases and it was only at that time the frequency of the fracture was realized and attempts were made to devise adequate treatment for a condition which too often had resulted in a large amount of permanent disability. Since that time many descriptions of the injury have been made, particularly by Osgood[4] in 1927 and Eikenbary[5] in 1928 and in more recent years by Huet,[6] Herzmark and Whitman[7] and Haggard.[8] Arthur Davis[9] in 1929 presented a detailed study of the condition, advising an attempt at reduction by hyperextension with the patient in a ventral position and demonstrated an adequate means of obtaining rather accurate reduction of the deformity which in his opinion resulted in cutting down total temporary disability and lessened the likelihood of permanent disability. Our reasons, in spite of this somewhat formidable array of work, for presenting this subject again is that since our original presentation[10] of the method in May, 1931, considerable study has been done by us and others on the method and we have formed conclusions as to the simplicity and efficiency of the maneuver which leads us to again call it to your attention.

The present study of comparative methods of treatment is based on the 78 compressed fractures enumerated above. Of these, 50 treated prior to January 1, 1930, were not decompressed. They were either kept in bed on a Bradford frame, on a hard bed, or a Taylor body jacket was applied in the position in which we found the patient and no attempt was made to correct the existing deformity. The period of disability based on these 50 cases is as follows: The average age was 47. The percentage of males was 72. The average disability in these 50 patients who had recovered sufficiently to return to work was 11 months. We found, however, that of this group 13, or 28 per cent, were still unable to work at the end of two years and should in our opinion be classed as permanent disabilities. Some of this group received fusion operations as did also some of the group whose average disability was 11 months. So we find in the patients in which no attempt was made to correct the deformity a total temporary dis-

*Read before the Great Northern Railway Surgeons Association at Glacier Park, Mont., June 29, 1934.

ability average of 11 months and approximately 28 per cent with sufficient total permanent disability to prevent them from engaging in hard, manual labor. In the second group of 28 cases treated since January 1, 1930, in which the deformity was reduced by the method to be described the average age was 48, the oldest being 73 and the youngest 18. A relatively large number of this group were around 40 to 45 at an age in which men are still active although their bones are beginning to become somewhat brittle. Males predominated in the ratio of about 3 to 1. In this group of 28 cases the average number of weeks in plaster was 7, the longest being 12 and the shortest 5. The average length of time in bed was between 9 and 10 weeks and the average length of total temporary disability was 5½ months, the shortest being 4 months and the longest being 9. There was of this group one case which should be classed as permanent disability. This patient developed a Schmorl's disease undoubtedly from the rupture of the nucleus pulposus at the time of injury and after she became ambulatory never was able to do anything until a fusion operation was done some two years later which has not been completed long enough to allow her as yet to resume her duties. There was in this series of 28 cases one death in a man 64 years old who on the third day after reduction developed definite and typical fatty pulmonary embolii and died in a few hours, this diagnosis being confirmed by autopsy. The complications which we have met in treating compressed fractures by the "jack" decompression may be rather briefly enumerated as first, ileus. It has been our observation that most patients with severe back injuries develop more or less ileus. This occasionally seems to be somewhat aggravated by the rather radical decompression which is done with the jack. We have, however, had no particular trouble in controlling this complication. The other most annoying complication is the development of sores underneath the cast and when these develop as they have a number of times in this series we feel our technique has been faulty in either the application of the padding or the application of the plaster. However, another factor of at least some importance is that after the first or second day following reduction these people are usually very comfortable as of course the pain in the back is entirely controlled when the fracture is reduced and the back immobilized.

Causation of these fractures is hyperflexion of the spine or more commonly the application of force in a vertical direction through the spine caused by a fall on the heels or buttocks; and indeed many of these have occurred from automobile riders being thrown violently up and down as the car goes over a bump. In younger people the spine is well protected against injury by the elasticity of the intervertebral discs and the nucleus pulposus which allow marked bending strain without undue stress being transmitted to the body of the vertebrae. As age increases the elasticity of these discs decreases and bones become more highly calcified and brittle, thus reducing the margin of safety. In this series by far the larger percentage of fractures occurred at the dorsal lumbar junction although isolated cases occurred in almost the entire spine and in four instances two or more vertebrae were fractured, the largest number observed being four. As a rule, however, relatively few fractures occur in the dorsal spine above the tenth because the thoracic cage affords rather marked protection to these higher vertebrae.

The question of diagnosis probably should not be dealt on too much at this time although it is an important one and of course it is true of compressed fractures of the spine as it is true of other fractures that treatment should be started relatively early although one is undoubtedly wise to wait until the primary shock of the injury has subsided. There is no positive way to make a diagnosis except by taking clear lateral X-rays in addition to stereoscopic anterior posterior pictures and it is well to be on the lookout for this injury following any major trauma to the back. The most constant symptom is pain. The most constant sign is muscle spasm. Occasionally a slight gibbus is present, oftentimes tenderness is found over the fractured vertebrae; less often root pains assist in making a diagnosis. Careful lateral X-ray studies will always make the diagnosis. If X-rays are taken immediately following injury in a patient who has not been up, the amount of compression along the anterior border may be slight and may require careful measurement of the anterior border of the suspected vertebrae for comparison with the anterior borders of the vertebrae above and below it to determine injury.

One of the oldest rules in surgery probably promulgated by Hippocrates is that the treatment of fractures and dislocations is best done by reversing the causative force. Here the causative force is hyperflexion of the spine (Fig. 1). Reduction must be accomplished by hyperextension of the spine, and all modern writers agree that hyperextension will lessen deformity, eliminate pain and hasten healing. Arthur Davis[9] has gone much further and states that sufficient hyperextension will reduce deformity completely and

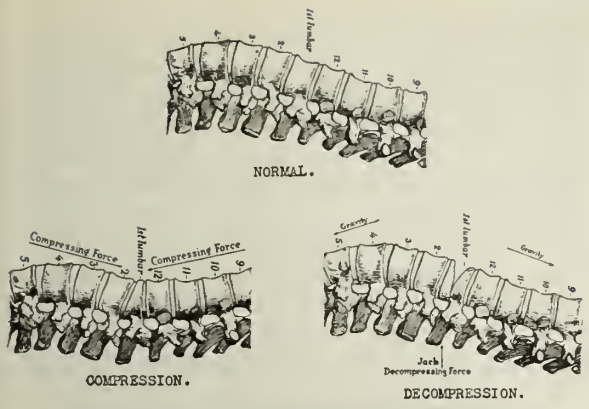


FIGURE 1

allow healing to take place in the cancellous body of the vertebra as rapidly, thoroughly, and effectively as it will in fractures of other bones. There are factors in the anatomy of the spine which help in this maneuver. They are, first, the usual integrity of the anterior spinous ligament; second, the strong and firm attachment of the cartilaginous intervertebral discs to the bone; third, the posterior spinal joints and lamina are usually not fractured and are strong cortical bone. It is evident that if sufficient hyperextension is obtained the crushed bony body of the vertebra will be carried with the adherent intervertebral discs. It is further evident that hyperextension will be stopped when the normal limit is reached by the intact anterior spinous ligament and that the posterior spinal joints and lamina will protect the cord.

Earlier methods of obtaining hyperextension consisted in placing the patient on an adjustable convex frame allowing gravity to slowly dislocate the fractured areas as the extension angle on the frame is changed from day to day. This has proven to be an excellent scheme and one which may still be used to advantage in some cases, notably in the aged and obese. However, it has some decided disadvantages. Patients on frames cannot be kept entirely immobilized. They require careful and skillful nursing. They require hospitalization during the entire period of active treatment and a high degree of hyperextension on the frame is difficult to maintain due to the inevitable sagging of the canvas and to the fact that the entire body of the patient must be kept in a tedious position and that the point of fracture cannot be entirely fixed.

The method of obtaining hyperextension described by Arthur Davis[9] (Fig. 2) is done by reducing the fracture with the patient lying prone, with the arms fixed to the top of the table, a sling is then applied to the feet which is fastened to a block and tackle in the ceiling and the spine is



FIGURE 2
Hyperextension method of Arthur Davis.

hyperflexed by lifting the patient's feet and pelvis clear of the table. It is sometimes necessary to dislocate the fragments by light pressure over the kyphos if the deformity is severe. A plaster paris shell is then made and the patient turned over into it where he remains six or eight weeks during convalescence. There is a disadvantage in this method. The pull on the feet is the factor which disengages the fracture, gravity meanwhile tending to compress the posterior spinal articulations and the lamina and although these structures are strong enough to resist buckling it is possible for them to be cracked in combination with the crushed body and it is conceivable that occasionally, while we are decompressing the fractured body we are going to cause compression of the posterior portion of the vertebra which might result in serious damage to the cord. It is for this reason that the following method is suggested.

Taylor,[11] in 1900, described a method of obtaining hyperextension in children with Pott's disease by the use of a light machine which he called the kyphotome (Fig. 3). The child lay on this while



FIGURE 3
Taylor Kyphotone.

a double spica body cast was applied. This would not be practicable in the adult. The condition can be simulated, however, with an ordinary fracture table by using a jack with a removable platform as the decompressing force (Fig. 4-a). In practice, the patient, either very lightly anesthetized or heavily narcoticized, is placed on a fracture table and sewed into a heavy saddle-felt jacket. An aluminum plate two and one-half inches wide



FIGURE 4A

is placed up and down over the entire spine external to the felt jacket and the feet are bound to the foot posts. A wide muslin sling is then placed between the table and the aluminum plate and is looped around the supportive arms on the masts of the fracture table and tied snugly (Fig. 4-b).



FIGURE 4B

A muslin sling is also placed below each knee and the thighs are slightly flexed, these slings being also attached to the supportive arms on the masts distal to the pelvis. Table is then dropped. An ordinary automobile screw jack is then placed with its upper end resting exactly at the point of kyphos, and by slowly and steadily raising the jack, the desired amount of hyperextension can be obtained without noticeable discomfort to the patient and entirely without danger of injuring the cord, as the force of gravity is not only pulling the compressed body apart but is serving to exert a pull on both sides of the injured vertebra (Fig. 4-c). Hyperextension may be considered complete when the patient's buttocks start to leave the perineal plate as at that point the anterior spinous ligament is starting to lift the pelvis. When the desired position is obtained a double spica body cast is applied from just above the knees high enough to include the entire thoracic cage (Fig. 4-d). The cast is trimmed in the usual

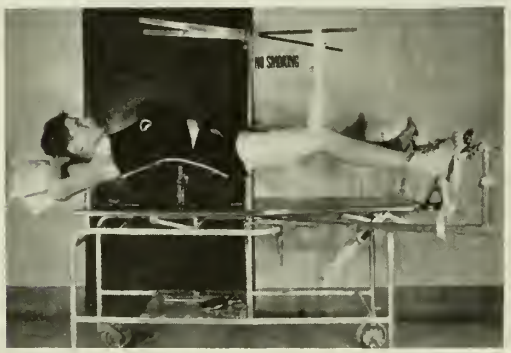


FIGURE 4C



FIGURE 4D

manner, or if it is thought advisable, the cast is bivalved and bound to the patient with trunk straps so that he can be turned on his face for daily cleansing. We ordinarily treat such patients on a Bradford frame with a block and tackle at each end to allow the nurses to handle them. The first patients treated by this method were left in plaster for twelve weeks. At present the large plaster is removed in six or eight weeks, as healing seems firm then, and in some slender patients in whom the fracture is in the lower dorsal spine the spica portion of the cast may be removed at the end of two or three weeks. However, ordinarily patients are more comfortable with the spica part of the cast left on as then there is no tendency for the cast to slip up causing pressure beneath the armpits. The patient is allowed to sit up on the back rest practically as soon as the cast is off and allowed to be up and about with a Taylor brace at the end of ten weeks. The brace is discarded in twenty weeks to allow the muscles of the back to get in condition, so that at the end of six months, when consolidation of the bone is complete, he can return to work.

Since using this method our ideas of healing of compression fractures have undergone some change. We formerly thought that this fracture healed by producing a fusion between the body of the injured vertebra and the one above and below it, which might be called a bone bridge. This is

a common observation. Sante and McCutcheon[12] found it in a series of 400 cases reported in 1925. Wallace[13] reported it in 1923 and other writers have noticed the same thing. In none of these 28 cases have we observed any indications of the formation of bone bridges, the vertebra apparently being restored to normal as far as X-ray can determine except that decompression is not always entirely complete.

It is our opinion that bone bridges form in compression fractures with deformity the same way that excess callus forms in other fractures with deformity and it is our further opinion that prolonged backache and disability of patients treated by simple recumbency, or untreated, may be due to the formation of this excess callus in the anterior portion of the vertebra.

We wish to show you a few lantern slides of patients with compressed fractures. (Figs. 6, 7, 8). Lateral X-rays being shown taken at admission and on the day the cast was removed and wish to show first the only permanent disability which occurred in this series, that being the traumatic Schmorl's disease (Fig. 5) previously mentioned, which apparently will happen every now and then in spite of our best intentions and probably cannot be avoided by any method of treatment now known.



FIGURE 6



FIGURE 7

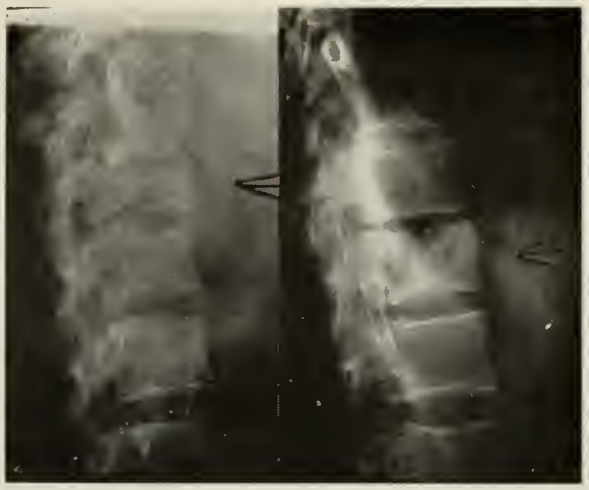


FIGURE 8

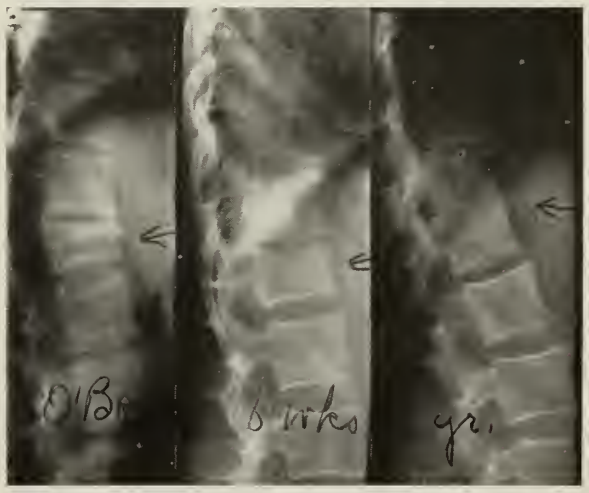


FIGURE 5
Traumatic Schmorl's disease. Note the complete absorption of the intervertebral discs in the one-year X-ray.

SUMMARY

1. Compressed fractures of the spine are relatively common injuries.
2. Diagnosis is frequently overlooked.
3. The period of disability is cut down by hyperextension treatment.
4. Hyperextension can be obtained by the use

(Continued on Page 750)

Prophylaxis and Treatment of Carcinoma of the Uterine Cervix*

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EARLY diagnosis and early treatment are the foundation stones in the control of cancer. Carcinoma in any part of the body develops on the base of a chronic basal epithelial cell proliferation, the result of a chronic mild infection or a long continued irritation. The irritant may be of a bacterial, dysfunctional, chemical or physical nature. This may be termed the exogenous or indirect causative factor. An unknown endogenous factor, however, is the direct cause of cancer. It probably is the loss of the growth-restraining principle and concerns the laws of the life and function of the cells about which as yet little is known. Our knowledge of the tissue changes is merely descriptive. Why the cells proliferate in such a fashion and what causes the cellular and nuclear changes, termed anaplasy or atypy, escapes us.

If the hypothesis of chronic irritation is correct, and if the exciting causes of cancer are known, then it follows that prevention of chronic irritation or the treatment or removal of chronic proliferative processes would prevent carcinoma later on. Careful and thorough examination of all accessible organs of the body should be included in the physical examination of our clientele, either when the patient consults the physician for medical advice or requests a health survey. In our special field it means the palpation, inspection and microscopic smear examinations of the genital organs. The patients expect such complete physical investigations, as the latter offer the only means for the recognition of tissue changes. In most instances, the precursors of carcinoma do not cause symptoms; they are said to be silent. Hence, it is the physician's imperative duty to discover abnormal tissue changes by his own efforts in comprehensive physical examinations.

According to Ewing, the requisites of a comprehensive examination for the origin, diagnosis, course, prognosis, treatment and prevention of cancer are:

(1) Complete physical examination, which must record the site of the lesion, the character of the growth and the extent of the growth.

(2) Roentgenologic study.

(3) Histological study to reveal:
  (a) the histological structure of the tumor;
  (b) the origin of the tumor tissue;
  (c) the grade of histological malignancy;
  (d) the grade of radiosensitivity.

Without all these data, the diagnosis is incomplete and the probable course and prognosis will be faulty, and the indicated method of treatment cannot be correctly determined.

I shall discuss with you the prevention, the early diagnosis, and the bases on which the indications for treatment of carcinomas of the uterine cervix should be placed. The prognosis will be discussed from the extent of the growth, and from the five year good end results.

Prophylaxis of Carcinomas of the Uterine Cervix

Chronic basal epithelial cell proliferations of the cervix reveal on inspection and palpation tissue changes which have been termed erosions. They may be papillary or ulcerative, may cause oozing of blood on local irritation, and are almost always the source of a profuse creamy or slate-colored discharge. Other diseases such as tuberculosis, chancre, leukoplakia, early carcinomatous nodes may have the same signs and symptoms. They all have one reaction in common. The application of compound tincture of iodine or Lugol's solution will stain the normal squamous epithelium of the vaginal portion of the uterine cervix a deep chestnut brown, as normal squamous epithelial cells contain glycogen. The abnormal or diseased squamous epithelial cells of the diseases mentioned, and the cylindrical epithelial cells of the canal mucosa do not stain as they are deficient in or devoid of glycogen.

Areas of negative reaction to Lugol's solution, when the history does not permit of a correct clinical diagnosis, require biopsy and microscopic diagnosis as one may be dealing with a malignant process. Low circular amputation of the cervix, if the lesion involves the greatest part of the surface, or V-shaped excision of the localized lesion, the incision being carried through the surrounding normal tissues, or scraping up the ulcerating tissues with a spoon, if the tissues be friable, should be done. Serial sectioning of all the tissues and microscopic examination of all

*Read before the Hennepin County Medical Society, Minneapolis, Minn., May 7, 1934.

slides will enable one to discover and diagnose early carcinomas. If carcinoma is not found then the diagnostic excision has been a curative one, as it removed the benign lesion.

The finding of atypia of the epithelial cells, down growth of epithelial cell columns without penetration through the basement membrane and submucous round cell infiltration, are the criteria for all neoplasias. The epithelial cell growth is almost always irreversible and almost invariably terminates in destructive lesions as seen in classical carcinomas.

The patient after the local excision should be kept under observation for about three years. The physician can detect a local recurrence while it is still free from symptoms, while the patient could not be aware of a recurrence until bleeding or pain appeared.

Thus by painstaking physical examination, chronic diseased conditions of the vaginal mucosa of the cervix may be found. The negative iodine test and the contact bleeding or oozing are presumptive signs of carcinoma. Excision of such areas in the surrounding healthy periphery and microscopic examination of serial sections of all the tissue enables one to recognize correctly the cellular pathology. Atypia of the cells, down growth without penetration of the basement membrane and submucous round cell infiltration are the histo-pathological criteria of a neoplasia, and if in addition a breaking through of the basement membrane occurred, an incipient carcinoma. Adequate treatment with radium should cure almost 100 per cent of these early cases.

Prophylaxis of carcinoma therefore means (1) the painstaking physical examinations of our female clientele in the average marrying age or older, whenever they appear for consultation and health surveys; (2) the treatment or removal of chronic diseased areas for microscopic diagnosis to exclude malignancy which may occur at all ages.

The Early Diagnosis of Cancer

Cancer must grow for some time before it causes symptoms. This early stage of cancer is said to be the silent stage. Objective signs of this stage are the initial cancer nodule and contact bleeding.

The incipient cancer nodule is of small size and clearly limited. It should not be larger than a split pea. The surface may be nodular or warty. The nodule leads to infiltration and early ulceration, the papilloma to proliferating cauliflower-like growth. Microscopic examination shows atypia and anaplasia of the epithelial cells, downward growth with destruction of basement membrane in the infiltrating inverting type or cauliflower-like tumors in the proliferative everting types, with latent tendency for down growth, and a subbasal round cell infiltration.

Due to the tendency of central necrosis on account of poor blood supply, the central core of the tumor becomes early friable. If such a nodule is touched with a dull probe, bleeding ensues. The bleeding is arterial, and continues for some time. The nodule and the contact bleeding are presumptive signs of cancer. More than 90 per cent of such nodules are not malignant. Hence, an excision of the entire nodule should be done, and microscopic examination of all serial sections will reveal the true pathology of the node.

An incipient silent carcinoma if adequately treated will be followed by five year good end-results in more than 80 per cent of the cases. The discovery of carcinoma during this stage, and the application of immediate and adequate treatment would put us in the control of cancer of the cervix.

Again, periodic health examinations at stated intervals—the easiest day to remember is one's birthday—must become a routine measure for doctor and patient alike. The two purposes of physical examinations are: (1) the determination of the state of health of the entire body; and (2) the detection of chronic tissue changes in all accessible regions of the body and their correct clinical interpretation to discover the early carcinoma.

The Treatment of Carcinoma

The object of the treatment of cancer is the total eradication or destruction of the entire growth with that method which from clinical investigation and experience is the best. The object of treatment is not to apply surgery or radiation therapy because one is a surgeon or a radiologist but to use the best method which may cure the patient. It may be said tersely: (1) Surgery is indicated if thereby all of the cancer can be eradicated without undue risk to the patient. Should a surgeon leave only a wee part of the tumor behind, the patient still has cancer. (2) Radiation therapy should be used if thereby the tumor can be arrested in its growth or destroyed. It means that the tumor must be confined within the radiation beams. If it has become disseminated so widely that it cannot be exposed *in toto* to the rays, then the cancer will not become arrested. The patient has received an incomplete and unnecessary treatment just as in an incomplete operation. (3) Palliative measures of treatment should be applied if neither surgery nor

radiation offer a cure. As such, these measures may be mentioned: (a) medical management to keep the cancer aseptic, to relieve pain, to stop bleeding and discharge, to stimulate the appetite, to combat anemia and so forth; and (b) radiations in small amounts to arrest bleeding, to stop pain, and to render the tumor crater free from necrotic material.

The indications for the various methods of treatment should be based on the clinical extent of the growth. The following factors should be determined by physical examination:

(1) Is the tumor localized to the cervix? A tumor about 1 cm. or less in diameter is clearly localized. The uterus has normal mobility. Traction on a tenaculum forceps applied to the cervix permits downward displacement of the uterus to the vaginal outlet and without distress to the patient. Such growths are designated as Clinical Group 1, the clearly localized cancer.

(2) The paracervical tissues are of dough-like consistency, and mobility of the uterus is decreased due to loss of normal elasticity of the paracervical connective tissue. Such growths are termed Clinical Group 2, the doubtfully localized cancer.

(3) The parametria are invaded. The infiltration is contiguous with the entire growth; however the tumor is mobile. Such neoplasms belong to Clinical Group 3, the invading growth.

(4) a. The growth extends along the parametria to the lateral pelvic fascia or along the sacro-uterine ligaments to the posterior pelvic fascia. There is marked fixation of the tumor mass.

b. The growth has extended to the bladder anteriorly or to the rectum posteriorly, or to the vagina laterally or downwardly.

c. Distant metastases in the hypogastric, iliac or lumbar lymph nodes, or in other tissues and organs have taken place. Such tumors belong to Clinical Group 4, the fixed and metastasizing growth.

The indications for treatment are:

Clinical Group 1: Surgery or perferably radiation.

Clinical Group 2: Radiation with radium and roentgen rays.

Clinical Group 3: Radiation with radium and roentgen rays.

Clinical Group 4: Palliation as discussed above.

This discourse has endeavored to bring to you simple and plain facts concerning the prevention and the early diagnosis of cancer of the cervix and the determination of extent of the growth. The latter enables one to place the individual case in the proper Clinical Group and thus to determine the methods of treatment indicated in each particular instance. It is not only applicable to carcinomas of the uterine cervix but to all cancers in any region of the body. The general practitioner observes relatively few cases during a year. Yet if he only would be cancer-minded and carefully examine all his patients at their first office call or for the purposes of periodic health survey, he would aid immeasurably in the control of cancer. It is not necessary that he apply himself to the difficult radical radiation methods, as these should be performed by the few men especially trained in cancer surgery and cancer radiology.

Fractures of the Spine

(Continued from Page 747)

of the convex frame; sling and shell or jack and cast.

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Newer Ideas in Diabetes*

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Billings, Mont.

IN HER infinite variety lies the charm of woman, and he who chooses medicine for his mistress will not find her, either, lacking in this quality. Rather will he find it hard to keep up with her ever-changing moods, and if he be a sluggish lover he will soon find himself hopelessly outdistanced by his many rivals. Never can he be sure of his understanding of her, and at all times he must be prepared to change his mind about her. In fact, he who desires mental rest had better choose another love.

Very true is this of that branch of medicine which concerns diabetes. Much work has been done upon it during recent years, and many new ideas have emerged, some of which have profoundly altered our conception of it. To bring a few of these before you is the purpose of this paper.

Since the discovery of Von Mering and Minkowski in 1889 that removal of the pancreas resulted in diabetes, and the further demonstration that as long as the islands of Langerhans were preserved the rest of the pancreas might be destroyed without producing the disease, it seemed to be pretty well established that it was caused by a lack of some secretion of these cells. When, further, a hormone was successfully isolated from them, and shown to be effective in controlling the symptoms, it was at once assumed that we had found out its mechanism.

But, unfortunately, physiological and pathological processes, like most other things in life, rarely admit of extreme simplification, and further investigation usually brings to light awkward facts which do not fit in with the assumptions. Thus it is not always possible to show changes in the pancreas, or even in the beta cells of the islands of Langerhans. Houssay and Biasotti[1] say: There are fatal cases of diabetes in which no typical lesions of the pancreas are found, and in which the extraction of the gland shows the presence of insulin in amounts that would suffice to assure life for several weeks. Warren, too, compared the changes found in the pancreas at autopsy in diabetics and nondiabetics, and concluded that practically any lesion found in the pancreas of diabetic patients can be duplicated in the pancreas of nondiabetic patients.[2]

*Read before the Staff of St. Vincent's Hospital, Billings, Mont., September 24, 1934.

However, while all this may be true, there is no doubt that insulin or an insulin-like substance is a necessity for the metabolism of carbohydrate, and, in the absence of insulin, glucose is neither metabolised by the tissue cells nor stored as glycogen for future needs. Consequently these waste away and the organism dies. In other words, no insulin, no carbohydrate metabolism, and, *per contra,* where carbohydrate metabolism goes on, insulin must be present. If, further, insulin be in excess, too great a breaking-down of carbohydrate occurs, the blood sugar, and eventually the carbohydrate reserves, are exhausted, and the animal also dies.

But though insulin is necessary for carbohydrate metabolism, and though the pancreas is its best source, it does not follow that this is the only source. Carbohydrate metabolism goes on in all animals, whether possessed of a pancreas or not, and also in plants. It, or something having similar effects, has been extracted from such things as shellfish, yeast, and vegetables. Collip calls these insulin-like substances glukokinin, and thinks they differ slightly from pancreatic insulin. Further, some measure of carbohydrate metabilism goes on in the absence of the pancreas. Soskin[3] removed the pancreas from dogs, and these were still able to take care of a considerable amount of carbohydrate. One of them actually retained as much as 68 per cent of administered glucose during the 18 days it lived. As the source of pancreatic insulin had been removed, some other source must have existed. Tuttle[4] says this was the tissue cells themselves, which secreted the insulin which enabled them to carry on their carbohydrate metabolism without the aid of the pancreas. He ascribes to this tissue insulin a considerable role in the ordinary metabolism of sugars, and contends that during fasting periods no pancreatic insulin is produced, and the animal is then entirely dependent on its tissue insulin.

However, it is fairly well agreed that in any case of diabetes some derangement of the insulin mechanism must exist. Of this there are various possibilities.

The one most commonly assumed is, of course, a destruction of the beta cells of the islands of Langerhans and a consequent deficiency of in-

sulin. This is the classical view, and has much to support it. Undoubtedly destructive or degenerative changes are very frequently found in the pancreas of those dying of diabetes, and experimental removal or destruction of these cells produces the disease.

On the other hand, the pancreas may be normal and insulin produced in sufficient amounts, but this may be neutralized by something else. It is well recognized that any infection will immediately lower the carbohydrate tolerance. This, of course, might be caused by toxic influences damaging the islet cells and reducing the supply of endogenous insulin. But even when we introduce insulin directly into the tissues, we find its effect very much decreased. In some infections, enormous doses have to be used to obtain any effect at all, indicating a directly neutralizing action of disease toxins upon insulin. Sweeney *et al.*[5] administered to animals diphtheria toxin, along with both insulin and glucose, and concluded that toxemia in some way interferes with the function of insulin, whether it is endogenous or exogenous in orgin.

Insulin may be neutralized by the antagonistic effects of other hormones or ferments. Trypsin will inactivate it.[6] Therefore, as both insulin and trypsin are produced in the same gland, it is conceivable that under certain conditions they may come into contact and the insulin be neutralized. But the tissue cells themselves can produce similar ferments, and these may oppose the action of insulin and produce diabetes.

The suprarenals have an antagonistic effect to insulin. We give epinephrine to counteract an overdose of insulin, which it does by mobilizing sugar from the liver and so raising the level of that in the blood. Suprarenal hyperactivity may be the cause of some cases of diabetes, and also accounts for the glycosuria of emotional states, where there is an increased liberation of epinephrine, produced by stimulation of an emotional center in the diencephalon. On the other hand, in destructive disease of the suprarenals, as in Addison's disease, there is a lowered blood sugar, for there is here a deficiency of adrenalin, and consequently a lack of its restraining influence on the action of insulin. Turner, indeed, reports a case in which the sugar tolerance curve was actually inverted.[7] However, after removal of both pancreas and adrenals the fasting blood sugar was not increased; there was little, if any, glycosuria, and large amounts of glucose were metabolised.[8] This can again be explained by the presence of Tuttle's tissue insulin, which was sufficient to carry on when not interfered with by adrenalin.

An excess of thyroid secretion will cause diabetes. We frequently find it associated with hyperthyroidism, and it then often subsides after extirpation of the thyroid. The subject, however, is by no means clear, for, while Burn and Marks[9] found that rabbits, after feeding thyroid, at first became so insensitive to insulin that ten times the usual convulsive dose was without effect, and epinephrine caused a greater increase in blood sugar than usual. After prolonged feeding of thyroid they became extremely sensitive to insulin and irresponsive to epinephrine, while at the same time administration of sugar either failed to produce a rise in blood sugar or actually caused hypoglycemia. It seems that at first the thyroid caused a greater production of sugar by the liver than the insulin produced could take care of, and the blood sugar rose, while later the insulin mechanism, as a result of the stimulation of the higher blood sugar, succeeded in producing enough insulin to offset the excess of thyroid. The effect of epinephrine, was at first to stimulate the production of sugar from liver glycogen, but when that became exhausted it had nothing left to work on. However, the action of thyroid secretion on the tissue cells themselves must not be lost sight of.[10]

Wilder *et al.*[11] tried the effect of total thyroidectomy in a case of diabetes where there was no evidence of hyperthyroidism, in the hope that by removing the antagonistic effect of thyroid hormone upon insulin they might remedy the diabetes. They produced a myxedematous condition, and to some extent improved the sugar tolerance, but conclude that the remedial result was not sufficient to justify recommending the procedure as a remedy for diabetes. The conclusion seems justified, for where there is no evidence of hyperthyroidism some other mechanism for the diabetes must be sought.

There is much evidence to show an antagonistic influence to insulin on the part of the pituitary gland. It has long been known that glycosuria very commonly occurs in acromegaly. This, as you know, is caused by overgrowth of the acidophilic cells of the anterior lobe of the pituitary, and a consequent excess of the growth hormone. One frequently meets with cases of diabetes where the signs of overactivity of the anterior lobe are quite marked. I have a three-year old girl under my care at present whose mother says that the child grew quite fast the six months preceding the onset of diabetic symptoms. The father, too, is a large man, as are all his family, while the

grandfather had diabetes for many years and presented distinct acromegalic features. Experimental proof is supplied by Barnes and Regan,[12] who injected anterior lobe extract into dogs and produced glycosuria and hyperglycemia. On the other hand, hypophysectomized dogs show a marked tendency to hypoglycemia. Houssay and Biassotti[1] have shown that, while the removal of the pancreas of dogs produces diabetes, usually fatal in one to four weeks, yet, if the hypophysis be removed in addition, glycosuria and hyperglycemia may not appear at all, and if they do are much diminished, the animals, in fact, surviving for several months or dying in hypoglycemic convulsions. Something here must have been removed with the pituitary which had kept the blood sugar high. This hormone (the diabetogenic hormone, so-called) and insulin are antagonistic. In the normal state they are nicely co-ordinated, so that an excess of insulin is met by a larger amount of the pituitary hormone, and hypoglycemia is avoided. Thus diabetes may be caused by either an excess of pituitary hormone or by a deficiency of pancreatic.

The fact that these animals can live without either pancreas or pituitary, and can take care of carbohydrate food, again shows that the carbohydrate metabolism, at least to some extent, may go on in the absence of pancreatic insulin, and again we may have recourse to Tuttle's tissue insulin to supply this necessary factor, which would be sufficient, in the absence of the antagonistic pituitary, to carry on ordinary functions.

There is some uncertainty as to the locus of production of the diabetogenic hormone. Glycosuria occurs in acromegaly, caused by adenomatous overgrowths of the acidophilic cells, which produce the growth hormone, and in adenomas of the basophilic cells, which produce the sex hormones. The known effects of posterior lobe extract in combating hypoglycemia may be due to its effects upon the adrenals. Cushing[13] suggests the participation of the pars intermedia, cells from which pass into and activate the neurohypophysis. Taking advantage of the fact that the ovarian hormone appears to suppress the pituitary sex hormone, Barnes, Regan, and Nelson[14] conceived the idea that it might also have the same effect upon the diabetogenic hormone, and administered it to dogs in whom diabetes had been produced by the removal of the pancreas, and in which, consequently, the pituitary principle was unopposed. They succeeded in markedly reducing the glycosuria.

A further suggestion that the pituitary and its adjacent structures may be more responsible for diabetes than the pancreas arises from its principal symptoms. Excessive hunger and thirst, with polyuria, are practically invariable accompaniments of diabetes mellitus. Hunger might be explained by the need of the body for carbohydrate food consequent on the excessive elimination of glucose, and thirst by the necessity for large amounts of water for its solution. But one meets with cases where all these symptoms are present and the patient is fat. Also in diabetes insipidus there are both excessive thirst and polyuria but no excretion of sugar. This is recognized to be due to some lesion, as from encephalitis, in the nerve cells of the diencephalon, a part intimately connected with the pituitary, and, if the excessive thirst in diabetes insipidus and the consequent polyuria are due to nerve injury in this region, it is perfectly permissible to assume that excessive hunger can be due to the same cause, for hunger and thirst are inseparable sensations, and one would expect the centers controlling them to be in anatomical contiguity. As a matter of fact in pituitary basophilism we have all together—polyphagia, polydipsia, and polyuria, with great adiposity and glycosuria. Which is the more responsible, however, pituitary or hypothalamus, is a much debated question.[15]

Some cases of diabetes seem readily to put on fat when treated with insulin. These may be cases where the pancreas is primarily at fault, for pancreatectomised animals, when fed on sugar with insulin, become quite fat,[16] though we must again remember that the victims of basophilic adenomas of the pituitary are also fat. These fat animals, when deprived of insulin, develop marked ketonemia, and rapidly go into coma, from which it is not always possible to bring them out by resumption of insulin, which suggests extra care in the treatment of diabetics to avoid obesity, for lean animals do not show the same tendency. Professor Best holds the liver responsible, which shows marked fatty changes.[17]

Here it will be convenient to refer briefly to what is known as hyperinsulism. In these cases the patient has hypoglycemic attacks, which are often with difficulty relieved by an excess of sugar. Some of them have been found to be due to a tumor of the pancreas, and an excessive production of insulin, thus suggesting the name, and with the removal of the tumor the condition has been relieved. However, there are other cases in which no tumor existed, and though part of the pancreas was removed, no relief was obtained. Some of these are probably due to a deficiency of pituitary secretion, allowing unrestrained action of pancreatic insulin, and if the diabetogenic

hormone of the anterior lobe can be isolated will probably be relieved by that.[18]

The influence of the liver on carbohydrate metabolism is profound. Removal of the liver is very shortly followed by hypoglycemic convulsions. A similar condition can be brought about by destructive disease of the liver cells, as in the case of carcinoma reported by Nadler and Wolfer.[19] What happens here is that the principal depot from which the body derives the continous supply of sugar needed for its functions has been removed. The potential supply of sugar is stored in the liver as glycogen, from which it is released as sugar as the needs of the body require. Small amounts are also stored in the muscles for their immediate needs. But the liver also manufactures glucose from proteins and probably from fats, and reconverts the lactic acid produced by the activities of the muscles into sugar. Insulin exerts a restraining influence upon this process. In the absence of the liver there is no source from which the sugar of the blood can be replenished as it is used up, and consequently the blood sugar falls and hypoglycemia results. On the other hand an excessive activity of this gluconeogenetic function will produce too much sugar and a hyperglycemia follows. In fact, some, amongst whom is Professor Best, contend that it is the liver which is most at fault in diabetes and that overproduction of dextrose is the major disturbance in the diabetic condition.[20]

If this is so, one is tempted to look upon diabetes in the obese, at least in so-called exogenous obesity, as a conservative process, intended to rid the system of an excess of foods, and where this process finally eventuates in the emaciation of classical diabetes, as another instance of the inability of nature's defensive mechanisms to remain within due proportions. The mechanism might be something like this: to overcome the harmful effects of excessive eating the liver produces glucose in such large quantities that the blood sugar rises beyond the renal threshhold and the kidneys let it go through. At the same time the excessive amount in the blood stimulates the center in the brain, so that the pancreas secretes more and more insulin, until it finally becomes exhausted, and fails to produce even enough insulin for the normal metabolism of carbohydrates and emaciation results.

Himsworth,[21] however, suggests another explanation. He contends that insulin as it is secreted by the pancreas is an inactive substance, and requires an activator. This, he says, is produced by the liver, and he calls it insulin kinase. It is the lact of this, due to disease of the liver, which is the cause of some cases of diabetes. He further says that in practically all the cases of insulin-resistant diabetes reported an abnormal state of the liver is recorded, and propounds the query whether the syndrome of abdominal pain, vomiting, and rapid descent into coma, with temporary insensitivity to insulin, which supervenes, apparently fortuitously, in balance diabetics, is due to impairment of liver function. Both theories, however, put the responsibility for diabetes upon the liver rather than the pancreas.

Tuttle[4] also believes that insulin as it exists in the pancreas and that as extracted for therapeutic purposes is inactive and requires an activator. This activator, he thinks, may be supplied by the tissue cells, or the insulin may be activated as it leaves the pancreas in the same way as digestive ferments, active trypsin being thus formed from inactive trypsinogen. He explains cases of diabetes with normal pancreas as due to lack of this activator, as also those cases in which injected insulin is relatively ineffective.

From a consideration of the effects of the hormones of these various glands we see what a delicate adjustment there is between them all. Nor is this to be wondered at when we reflect upon the vital importance of a constant supply of dextrose to all the cells of the organism, a supply which must be continually and rapidly varied to meet the changing conditions of rest or activity of the moment. This hormonic control is something like the system of checks and balances of the United States Constitution, designed to keep each branch of the government from encroaching upon the prerogatives of the others, and yet at the same time ensuring that each will at the proper time stimulate the others to their proper duties.

Yet all these checks and balances have failed to prevent occasional conflicts between the executive, legislative, and judicial branches. Each one at times has excited the jealousy of the others, in the seeming effort to extend its powers and to impose upon the prerogatives of the other. Struggles for supremacy have, therefore, been of frequent occurrence. Similarly, at times, some hormone gets out of control and the resulting in balance causes disease. Collip[22] claims antihormones are developed to check the excessive activities of hormones. This would explain how the need for insulin in many cases of diabetes increases. An antihormone is produced to neutralize the the exogenous insulin introduced. It is something like the marshalling of the legislative forces to secure the necessary numbers to overcome the Presidential veto.

But beyond this system of hormonic control, there is also that of the central nervous system. The direct influence of the central nervous system over carbohydrate metabolism was shown years ago by Claude Bernard's classical puncture of the floor of the fourth ventricle. This was probably due to injury to the vagus center, or, according to Cushing[13] to injury to nerve bundles leading from a center in the hypothalamus, for the right vagus apparently regulates the production of insulin in the pancreas, around the islet cells of which is a plexus of nerves in which this branch of the vagus terminates.[10] The control is probably brought into play directly by variations in the level of the blood sugar, a rise of which stimulates the center so that an increased production of insulin occurs.

In addition, the sympathetic system controls the production of sugar in the liver. Stimulation of this system produces a hyperglycemia by an increase in the amount of sugar manufactured by the liver. It also controls the secretion of adrenalin, which has an antagonistic effect on insulin. Thus, an abnormal increase in adrenalin would, by neutralizing insulin, allow the unregulated production of sugar by the liver and a rise in its blood concentration. There is thus a quite extensive mechanism which assures that during times of stress, as during violet exercise, when much sugar is required by the muscles, a large amount may be thrown rapidly into the blood.

Such are a few of the newer ideas on diabetes, so far as I understand them, and such is a feeble attempt to suggest their possible significance. It is true that in nature's infinite book of secrecy, a little can we read, but it is, unfortunately, only a very little, and there are many gaps in our knowledge. The literature is enormous, but in spite of this much of it is still shrouded in mystery, there are many apparent contradictions, and there is much one cannot understand. In it all, nothwithstanding, is very great ground for optimism. With the conception that diabetes simply means failure of the islet cells of the pancreas, the possibilities for successful treatment are limited to supplying the lacking hormone. With a wider viewpoint, one may have a reasonable hope for other and more convenient methods. In any case, diabetes is not a simple problem, and the diabetic deserves a closer study than the mere examination of the urine and the blood, and better treatment than that furnished by the diet tables of the drug manufacturers, or even by the hospital dietitian.

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The JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA, *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

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South Dakota State Medical Association
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MINNEAPOLIS, MINN., DECEMBER 1, 1934

THE CONTROL OF CANCER AND TUMOR CLINICS

How often do we still see patients who, through neglect and indifference, allow tumors to grow until the condition is hopeless? Different societies, lay and professional, are endeavoring to bring this problem to the people, and by means of their propaganda, to stress the dangers of this neglect. Physicians, no doubt, are daily instructing and advising their patients about cancer.

One of the best means of combatting this scourge is through the agency of the tumor or cancer clinic. These clinics have been functioning in many states. Patients are brought to these clinics, held at a convenient place and at a convenient hour, for the purpose of diagnosis and discussion. Much value is derived from this informal discussion of these cases.

The majority of patients do not hesitate to appear before a group of physicians, and they are even eager to submit to an examination. It requires only a little tact on the part of the physician in explaining the advantages one derives from it. The patient thus gets the advice and benefit of the consultation.

County societies could arrange a separate hour for this purpose, so that their program would not conflict with that of the tumor clinics. The effort and time spent in this work is of inestimable value to the physician and to the patient.

The battle against cancer mortalities should go on forever. With our advances in surgical technique, X-ray, and radium therapy, the medical profession is now able to cope more successfully with the early conditions of malignancy. Latest statistics give encouraging reports as to cures.

Early diagnosis, and early consultation of patients with their physicians at the first appearance of a growth, will help considerably in checking this disease and prolonging life. A. K.

DISCRIMINATION OR CUSTOM

While the government's delegated alphabet committees are avowedly striving to increase the cost of every commodity that the consumer must buy, there appears to be one outstanding exception. The manufacturer, wholesaler and retailer in every line of industry is protected by price-fixing codes and anti-chiseling regulations that establish inescapable prices for their goods. The one exception is the physician. He must shift for himself as best he can.

Public relief must, of necessity, contemplate the payment of these established and so-called fair prices by agencies that furnish food, shelter and raiment in order to fit in with the program of national rehabilitation. When it comes to the physician, however, he is asked to take a cut. It is reported that the contact officers who are organizing medical relief units in the various states have suggested a 30 per cent and in some cases a 50 per cent discount of that which was pre-

viously set up and conceded to be a reasonable fee schedule. The president has already made a basic commitment to "operation for profit." How does this pronouncement fit in with the attitude toward our profession when it is generally conceded that the operating expenses of a medical practice in the first place is 50 per cent of gross and in times like these even 70 per cent? The War Department comes along with a request that members of the medical profession give physical examinations, inoculations and vaccinations to C. M. T. C. candidates without any charge whatever, so that does not answer the question. It has become a habit to expect it.

We're a patriotc bunch, alright, and willing to go the limit in assisting our government and our fellow men but it appears that our material needs are often forgotten. It is altogether too complimentary to assume that the medical profession alone can live on adulation. A. E. H.

Proceedings of the Minneapolis Clinical Club

Regular meeting, October 11, 1934. President E. W. Hanson, M. D., in the chair.

RELATION OF SARCOMA TO INJURY

DR. S. R. MAXEINER

(Abstract)

A review of the literature relative to sarcoma and its relation to trauma reveals a very great divergence of opinion. A large number of cases which give an antecedent history of trauma are reported, but practically no case of trauma that is followed on to the development of sarcoma. It is natural that the greatest number of reports concern the extremities, where sarcoma is most likely to occur, and where injuries are most frequent.

Coley reports many cases of sarcoma with antecedent history of trauma, while Codman takes an almost diametrically opposite position, maintaining that the injury in these instances is coincidental, but not the cause of the sarcoma. In most instances trauma aggravates rather than causes the sarcoma.

Due to the fact that a large number of these cases come before the Industrial Commission, many awards have been granted on the basis that the trauma aggravated, rather than caused, the sarcoma. Very definite postulates have been formed into which any given case must fit before it can be recognized as compensible by the Industrial Commission.

The writer has had no instance in which sarcoma developed upon injury, and McKendrick states that there is no authentic case quoted in medical literature where it can be proved beyond a doubt that fracture caused sarcoma.

A case is reported which was tried before the Minnesota Industrial Commission on the basis of a sarcoma developing at the site of injury in which the Industrial Commission ruled against the plaintiff on the grounds that he was unable to prove the existence of a bona fide, adequate trauma.

The complete paper presents a generous review of the literature with a large number of references and a detailed case report.

Discussion

Dr. E. T. Evans: This is a most important paper. It is very interesting, and I am thankful to Dr. Maxeiner for his excellent review of the literature. I, personally, have been faced with the same situation; but my case did not come to trial.

I took care of a patient who came to me in December, 1931, complaining of a subdeltoid pain. I made a diagnosis of subdeltoid bursitis and put him on salicylates with complete relief of his complaint.

In April, Dr. Kertecz from the North Side sent him to me with the diagnosis of sarcoma. Then, going into his history, he told me the six weeks prior to his seeing me for this subdeltoid bursitis, the top of a gas tank hit him over the shoulder region. In April, 1932, he had a large sarcoma and I did a scapulo-humeral disarticulation. The man died about six months later of metastasis.

Dr. McCartney saw the case, hopeless from the start, and all I can say for myself is that in taking his arm off I at least gave him a little comfort and a little hope. The insurance company settled.

In December this patient had nothing but localized tenderness, and a few grains of salicylates gave him complete relief for about three weeks. I cannot believe that this man developed his sarcoma from the trauma. It was simply coincidence.

As to Haas's remarks that bone biopsy being negative at time of injury is a proof of the original injury causing the tumor, one asks how many sarcomas have ever developed in the hands

of bone surgeons or general surgeons, how many sarcomas have ever developed after bone surgery? I personally do not know of any, and when Dr. Maxeiner made the remark about the case of Coley's after a fracture it was a surprise to me.

I have had a case of a bone cyst that was rather interesting from the standpoint of conclusions which might have been drawn. A patient with a bone cyst developed a pathological fracture of the tibia with a history of trauma. I did a biopsy, and it was negative. The next week I proceeded to curette out that giant cell cyst, which was considered benign, and when I got to the base of it I found it had infiltrated a bit. I did my bone graft for the pathological fracture, but sent in that specimen from the muscle. The diagnosis came back sarcoma; so I promptly amputated.

Supposing I had gone ahead and had not recognized that it had infiltrated, and then did my curettement and did my bone graft, and later this man died of sarcoma with a negative biopsy before—what would the conslusion be? Did surgery aggravate it? Some of these questions of so-called surgical aggravation may drop into that type of classification. Personally, I will stand on this until someone can prove that I am wrong. I think the anlage is present, and then you come into the question of aggravation. If you come into the question of aggravation, I think that the aggravation should come in the three weeks period, and not the year period. Nature is too good to us and heals our traumata too well.

As to the question of single and repeated trauma, repeated trauma can be a factor, and I am glad Dr. Maxeiner has put forth the clarification of the major and minor postulates from a medical and legal standpoint. I think they will be good guides for the rest of us in the future. I think Dr. Maxeiner is to be congratulated for his careful working up of this paper. It is a subject on which all of us may be asked for an opinion.

Dr. J. S. McCartney: I want to thank Dr. Maxeiner for his very delightful paper. It has given me a lot of valuable information.

The question comes up as to the relation of the injury sustained and the tumor that subsequently develops. It comes up most frequently in connection with bones but also in connection with tumors of the stomach, the breast, and here, there, and elsewhere. It is perfectly true that some of these patients have bona fide injuries. We have quite a number of bone tumors on our records which occurred before the time Workman's Compensation was in effect, and where there was nothing to be gained by the patient in giving the history of trauma. We probably have something upwards of one hundred sarcomas of long bones on record in the department. An interesting thing about them is that there isn't one of them, so far as I know, where the tumor has developed after a fracture. The blow they are supposed to have sustained was usually a severe trauma, but not one that produced a fracture. In that case, what might one examine at the time of the injury to determine the presence or absence of any abnormality? Doubtless, the only thing you could get would be a piece of blood clot, a bit of torn muscle, or a part of a torn tendon, or something of that sort. In the case of a fracture, the only thing you could get would be a picture of the fracture, which would not show you a thing. I do not see how anyone could get anything at all on which to do a biopsy in a bruise of the extremity in the hope of picking up one or two cells in a hemorrhagic mass that one might say was the antecedent of a tumor.

There is one case which occurs to my mind, and which is somewhat similar to the one Dr. Evans mentioned: the tumor developing after surgery. The patient had what was apparently a solid form of osteitis fibrosa. It was biopsied and there was nothing in it but osteitis fibrosa. The man developed a wound infection and an osteomyelitis. A biopsy done sometime later showed definite sarcoma. There was none present in the original section at all. It was watched very carefully. An amputation was done and the man subsequently died of metastasis.

One might argue that in that case, the operative procedure with the biopsy and the cleaning out of the disease, stimulated the benign form of tumor to take on malignant characteristics. Some people feel so strongly on that point that if the diagnosis can be made otherwise, biopsy should not be done, but the disease treated by radiotherapy, believing that radio-therapy will destroy benign forms of osteitis fibrosa and also the giant cell tumors.

It would seem strange that if trauma has anything to do with sarcoma, it doesn't develop more often in the presence of a fracture. There certainly is much greater trauma in that case. In the absence of a fracture there is very little tissue to be repaired, unless there has been extensive hemorrhage with destruction of muscle, etc. In the case of a fracture, there is some necessary new tissue formation, but in the case of a bruise there is little or no need of actual proliferation of tissue leading to repair.

Dr. E. T. Evans: What we have heard about bone tumors does not necessarily apply to fascial sarcomas. Fascial sarcoma may develop from trauma. Dr. Geist opened down on every tumor mass in the region of the muscle, fascia or tendon, and took it out to be sure it was not sarcoma. That is an entirely different problem from the bone sarcomata.

Dr. S. R. Maxeiner: I have nothing more to add except with reference to the extent of the injury. There is no accord whatsoever as to the degree of trauma necessary to produce sarcoma. One author contends that there must be tissue destruction, and another says this is entirely unnecessary. The whole subject is unquestionally in a turmoil.

PUBIOTOMY FOR FUNNEL PELVIS WITH SUBSEQUENT NORMAL DELIVERY IN SECOND PREGNANCY

DR. R. E. SWANSON

(Abstract)

A case was presented with funnel pelvis. The membranes had been ruptured seventy-two hours, and an unsterile vaginal examination had been made. Pubiotomy was done instead of a Porro section. A live baby was delivered by forceps. A subsequent pregnancy delivered normally. A permanent enlargement of the pelvic outlet was obtained.

To be published in full later.

X-rays were shown as follows:

X-ray: This X-ray shows the head high, not engaged, entering the pelvis. This was taken some few hours after admission, and shows the outlet contraction of the pelvis.

X-rays: This shows the condition after delivery, with the pubiotomy through the left pubic bone with the separation there, permitting successful delivery of a living child. This shows a very definite widening of the Bis. Ischial diameter.

X-ray: This shows the condition of her pelvis at the time of her return in her second pregnancy, showing the nice separation in the region of the pubiotomy without bone formation. Many men who do pubiotomies say they heal by the formation of new bone or the formation of scar tissue. This obviously is a clean healing of a pubiotomy wound without any bone formation. This was taken approximately eleven months post-section.

Discussion

Dr. Donald McCarthy: Did this patient have any difficulty in getting around?

Dr. R. E. Swanson: None whatever, no waddling gait, no pain on locomotion whatsoever.

Dr. H. B. Dornblaser: I think this is a very interesting subject. I was very pleased to hear Dr. Swanson's excellent paper.

I had a patient on whom we did the same thing with about the same experience. She had a long hard labor and finally when she could not deliver we did a pubiotomy. In about two years she came back in her second pregnancy. We watched her carefully and were prepared to interfere whenever necessary but she pushed the child through without any difficulty.

I think pubiotomy now is an operation for which, as Dr. Swanson says, there is a very limited field of usefulness but occasionally it is a life-saving procedure.

Dr. R. T. LaVake: This excellent report of a perfect result brings into relief the possibilities of pubiotomy in the presence of an outlet contraction. The results in this case definitely substantiate the well known contention that the operation not only permits of immediate enlargement of the outlet but, if properly handled, results in a permanent increase in transverse outlet measurements.

These observations are introduced in discussion to emphasize a point that I gathered from the preliminary deliberations in this particular case, namely, that the operation was chosen because it was deemed better for the woman's future than the Porro operation; but that had this woman presented in labor under circumstances not involving potential genital infection and when a Cesarean were not contraindicated, the Cesarean would have been the operation of choice.

Dr. E. T. Evans: I think this case is a terrific blow to the usual post-partum diagnosis. Here we have a case in the presence of involution, the pubis cut through, and she did not develop a sacroiliac relaxation. I think it is proof of the modern conception of the orthopedic surgeons: that sacro-iliac relaxation as such is very rare. She should have developed one, and she did not.

Dr. R. E. Swanson: I am very sorry to say I do not agree to all the objections to this operation. I feel that many of the operations of the past were not done under modern aseptic conditions. I do not believe, except for the danger of hemorrhage in anomalous vessels, that we need fear infections so much as we did in the past.

I believe this operation should be considered in cases where Cesarean section will result in loss of the uterus even though some simple complication does enter the picture.

Jas K. Anderson, M.D.,
Secretary.

NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. Wallace P. Ritchie was recently married to Miss Alice R. Otis, both being residents of St. Paul.

Dr. S. S. Jones, one of the pioneer physicians of Frazee, Minn., passed away last month at the advanced age of 85 years.

Dr. R. E. Scammon, of the University of Minnesota, was a guest speaker at a recent meeting of the Womans Club at Duluth.

Dr. J. F. Paddleford, one of the leading physicians of Miller, S. D., passed away last month after a short illness at the age of 55 years.

Dr. W. H. Halloran, Jackson, was elected president of the Southwestern Medical Society at its meeting held last month at Fulda, Minn.

Dr. N. K. Hopkins, Arlington, S. D., was out hunting pheasants recently, when his gun went off accidentally, leaving him minus several of his toes.

Since the Chamberlain Hospital, Chamberlain, S. D., was first opened, over 27 years ago, they have given treatment or advice to over 75,000 patients.

Dr. Edward D. Greenberger, formerly of New York City, is now located at Mankato, Minn., where he has become associated with the clinic of that city.

Construction has been started on the $250,000 Indian Tuberculosis Hospital at Ah-Gwah-Ching, Minn., as it is planned to have it ready for service in the early spring months.

Dr. Frank L. Darrow, Fargo, was the guest speaker at the October meeting of the Richland County Medical Society, held at Wahpeton, his subject being "Treatment of Diabetes."

Dr. Charles H. Mayo, Rochester, was elected president of the Interstate Post-graduate Medical Association of North America at the annual meeting, held last month in Philadelphia.

A new hospital has recently been opened at Harlowton, Mont., with liberal contributions from the medical profession and leading organizations in the many progressive towns located near that city.

Dr. Isaac D. Alger, who has been in active practice in Minneapolis for over 60 years, passed away on November 10, at the advanced age of 90 years. Dr. Alger was a graduate of Harvard in the class of 1864.

The Mower County Medical Society held another enjoyable meeting at Austin, Minn., last month, with Dr. E. L. Kannary, St. Paul, presenting a paper on "Treatment of Skin Diseases with Ultra Violet Light."

Dr. Percy T. Watson, who for a quarter of a century has fought plagues in China, was the principal speaker at the annual dinner meeting of the Northwestern Society of Radiographers recently held at St. Paul.

Observing the 50th anniversary of the opening of the first tuberculosis sanatorium in the United States, the Minnesota Public Health Association held a dinner meeting at Minneapolis on November 23 in commemoration of same.

Dr. Esmond R. Long, of Philadelphia, discussed the latest developments in the battle against tuberculosis as guest speaker at the annual meeting of the Minnesota Public Health Association held in the Twin Cities last month.

The Stearns-Benton Medical Association held their monthly meeting at St. Cloud, with a large attendance and after an enjoyable dinner being served, an interesting program of various topics was discussed by Drs. Branton, Jones and Rumpf.

Dr. H. O. McPheeters, Minneapolis, addressed a joint meeting of County Medical Societies at Estherville, Iowa, on November 15, giving a discussion on varicose veins which was followed by a presentation of cases with demonstration of technique.

Plans for the 1935 annual meeting of the Minnesota State Medical Association in Minneapolis in June, 1935, are being formulated at a meeting of the organization's program committee. Dr. W. A. Coventry, Duluth, is president of the association.

Dr. Walter C. Alvarez, chief of the gastro-intestinal department of the Mayo Clinic, addressed the members of the Seventh District Medical Society at Sioux Falls, S. D. His subject was "Digestive Troubles of the Relatives of the Insane."

A large gathering of physicians and surgeons attended a dinner meeting at Thief River Falls, Minn., last month, with Dr. H. M. Blegen, president of the Red River Valley Medical

Association, presiding. Many interesting papers on medical topics were presented.

Maintaining that three out of every four American boys between 12 and 18 years of age suffer some physical ailment which could be corrected easily, Dr. Charles H. Mayo, of Rochester, endorsed a plan to subject the country's 692,746 Boy Scouts to an annual health examination.

Dr. and Mrs. William J. Mayo, Rochester, observed their fiftieth wedding anniversary November 13. The elder of the Mayo brothers and his wife were honored at a reception by members of the Mayo clinic staff in the library of the clinic. The Mayos were married November 20, 1884.

At the annual meeting of the Renville County, Minn., Medical Society, recently held at Bird Island, the following officers were elected to serve during 1935: Dr. R. S. Marland, Fairfax, president; Dr. A. A. Passer, Olivia, vice-president, and Dr. J. Dordal, Sacred Heart, secretary.

The youngest student to graduate from the University of Minnesota medical school since 1915, Dr. Irvin Kerlan, Minneapolis, aged 22 years, has completed his interneship at University hospital and successfully passed his state board examination at about the age most prospective doctors are entering the medical school.

Dr. R. W. Bradshaw, president of the American Student Health Association, addressed the Tennessee Education Association at Knoxville, Tenn., October 26, on "Hygiene Teaching in Secondary Schools," and the Mississippi Valley Section of the American Student Health Association on "What the College Expects from the Student Health Service."

The Minnesota State Medical Association broadcasts weekly at 10:30 o'clock every Tuesday morning over station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). The speaker is William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of December will be as follows: December 4, "Shortness of Breath"; December 11, "Gasoline and Kerosene Poisoning in Children"; December 18, "Mental Hygiene"; December 25 (Christmas).

The Minneapolis Surgical Society will hold their Annual Symposium of Fractures at 7:45 p. m. on Tuesday, December 11, at the Auditorium of Hennepin County Medical Society. The following members and guests will take part in the program: Dr. Harvey Nelson, "Fracture Disability Estimation"; Dr. E. A. Regnier, "Fracture of Neck of the Femur"; Dr. R. C. Webb, "Fracture of Upper End of the Tibia Involving the Knee Joint"; Dr. George R. Dunn, "Fracture of the Os Calcis"; Dr. R. G. Allison (by invitation), "Pathological Fractures"; Dr. Willard White, "Results in Fracture of Spine"; Dr. A. A. Zierold, "Newer Methods of Determining Extent of Traumatic Brain Injury"; Dr. George D. Eitel, "Fracture-dislocation of the Shoulder." A cordial invitation is extended to all of the profession to attend this meeting.

Dr. Gerald B. Webb, president of the Colorado School for Tuberculosis, and research director of the Colorado Foundation for Research in Tuberculosis, will deliver the first John W. Bell Tuberculosis Lecture before members of the Hennepin County Medical Society at the December 3rd evening meeting. Dr. Webb is a past president of the National Tuberculosis Association, a member of the International Union Against Tuberculosis, and a widely recognized leader in the tuberculosis field. The John W. Bell Tuberculosis Lectureship was established in the Hennepin County Medical Society in May, 1934, by action of the executive committee of the Hennepin County Tuberculosis Association, with the approval of the executive committee of the Hennepin County Medical Society. Each year, the lectureship will bring to Minneapolis a distinguished leader in tuberculosis work to appear at the December evening meeting of the medical society. The lectureship is supported by the Hennepin County Tuberculosis Association. A tribute to the late Dr. John W. Bell, of Minneapolis, in whose honor the lectureship was established, will be made at the meeting by Dr. J. F. Corbett, one of Dr. Bell's closest friends. The part taken by Dr. Bell and others in the founding of the Hennepin County Tuberculosis Association will be discussed by Dr. Thomas S. Roberts. Dr. N. O. Pearce is chairman of the committee on arrangements for the first John W. Bell Tuberculosis Lecture. He is assisted by Dr. J. F. Corbett, Dr. George D. Head, Dr. Thomas S. Roberts and Dr. H. L. Ulrich. Members of the committee who selected the speaker include Dr. Walter J. Marcley, Dr. C. B. Wright and Dr. J. M. Hayes, ex-officio, representing the Hennepin County Medical Society, and Dr. J. A. Myers, Dr. E. S. Mariette and Dr. F. A. Erb, ex-officio, representing the Hennepin County Tuberculosis Association.

ADVERTISERS' ANNOUNCEMENTS

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New Series
Vol. LIV, No. 24

Pediatrics*

Clinic of E. F. Robb, M.D.
Minneapolis

WE HAVE, through the co-operation of your local committee, several interesting cases to show you this morning. We have tried to pick cases that are practical and that you are likely to see in your office practice every day. We have not time to go into great detail but will try to bring out some of the most important points in diagnosis and treatment.

Case 1: Mongolism. Presented by R. E. Pray.

This child, aged 16 months, is the result of a normal pregnancy and delivery. A few days after birth cyanotic spells without mucus, crooked little finger and a suspicious slant to the closed eyes plus an unusual amount of relaxation caused us to warn the family that we might be in for trouble.

As the child developed the typical signs of mongolism became more apparent. The family history is good. There are five other children perfectly normal.

DR. ROBB: This is a case of mongolism. Quite a number of these are referred to us. They are referred, I suspect, not so much for diagnosis but for us to break the news to the parents.

These cases are so similar in nature that if you see one it is difficult to miss the next one. They even seem to have the same coloring. While they no doubt occur, I can't recall ever having seen one with black hair. They have all had sandy colored hair. The milder or borderline cases are sometimes confused with cretinism.

A diagnosis of mongolism can often be made in the newborn ward and always in the first few months of life. These children are usually of a happy disposition but very susceptible to upper respiratory infections. There is no great retardation in their physical development but there is marked relaxation of the joints. The eye margins slant inward and downward and in most cases we find definite epicanthic folds at the inner angles. The centers of ossification are nearly normal, this being one of the important points in differentiating this condition from cretinism, in which there is a delay in ossification. The shape of the head is quite characteristic, the profile showing a flattening of the face and of the occipital protuberance.

There is nothing particular in the treatment. These children should have the same general care as all other children and the outlook is always questionable. Being susceptible to intercurrent infections, they commonly succumb during the first four or five years of life.

There have been many theories suggested as to the cause of mongolism. An endocrine disturbance has been suggested but endocrine therapy is of little or no value. The percentage of syphilis is no higher than in normal children. They do seem to occur more frequently with older parents, and also seem to occur most often at the end of a series of pregnancies, but this does not always hold true.

There is nothing about the pathology that is characteristic. They never reach normal under any treatment that is known at present.

*Informal clinic at the Forty-seventh Annual Meeting of the North Dakota State Medical Association, Fargo, N. D., May 29, 1934.

Case 2: Hypothyroidism. Presented by Dr. R. E. Pray.

This girl is 9 years old. Three years ago the school informed the mother that her daughter was not growing proportionately and this the mother admits she had suspected for several months. The patient is one of seven children, all perfectly normal, large children. The mother and father are splendid physical specimens. The mother brought the child in with the findings of a typical cretin with a basal metabolic rate of —39. She has grown four inches since 1932 and has been on thyroid, three grains daily to begin and now one grain. Her basal metabolic rate is now —1. The child's mentality is good and her work compares favorably with the other children in her class, which is the fourth grade.

Dr. Robb: This is a mild case of hypothyroidism. The patient is much shorter than a child of nine should be, but is otherwise rather normal physically. The shortening is mostly confined to the femurs. Hypothyroidism varies in degree and seldom manifests itself during the first few months of life. Apparently enough thyroid is carried over at birth from the mother to meet all needs during the first few months. In most cases, these babies appear normal during this time in every way. They are bright, happy and contented. In fact they are too happy and contented. They tend to gain weight rapidly, usually being over-weight. A dry skin, a hoarse voice and either sparse or coarse hair are among the early manifestations. As the condition progresses a peculiar facial expression develops. The nose tends to flatten out between the eyes and is wider than normal, mouth breathing develops and the tongue becomes thickened. Growth in the long bones is retarded and is particularly noted in the femurs. The fontanelle closes late and there is a delay in appearance of the centers of ossification in the wrists. Basal metabolic rates are lowered, and usually there is a decided tendency to constipation.

If you are to get the most benefit from thyroid therapy the earlier it is started the better. The mentality definitely suffers in these children unless thyroid treatment is started early. This little girl, they tell me, is right up with her class in school, which is unusual since she was given no thyroid until very recently.

As far as treatment is concerned, there is a lot of misconception about the amount of thyroid that should be given. Enough must be given to make up the deficiency that exists; this amount varies greatly. As a rule, these children are under-treated. With a baby seven or eight months old, we usually start with about one grain of desiccated thyroid daily, watching for symptoms of hyperthyroidism. The most common of these are restlessness, irritability, loose stools and a rapid pulse. If none of these symptoms develops, the dosage should be increased. It is desirable to give as much thyroid as possible without producing signs of hyperthyroidism. The dosage in this case has been controlled by the basal metabolic rate which has markedly increased. However, basal metabolic tests are not always available, and in young children, not entirely reliable. Clinical signs are probably the best guide in younger children. This little girl should do well as there is apparently only a slight deficiency in thyroid secretion.

Case 3: Abdominal pain. Spastic colon. Presented by Dr. R. E. Pray.

This boy is 8 years old. He had severe "colds" for two winters and developed a unilateral mastoid infection which was operated upon and following that he never seemed to quite pick up. A year later he still had to have something to keep his hemoglobin up and his appetite was not good. Two years ago he began to complain of pain in the abdomen, with no relation to meals. There was some tendency to constipation but this was easily remedied. He never had any definite pain or tenderness until four months after he first came to us, when the pain localized, seemingly, in the right lower quadrant, although the white blood count was only 10,000. The appendix was removed three years ago but the pains have continued off and on. He never has them at night and they never interfere with his play. He is not a good eater, although he is a perfectly well child otherwise. He is more hyperactive now than he used to be and is quite a ringleader in school. There has never been any increase in the white blood count, no definite tenderness, he has never had any fever and the bowels are now all right. A gastro-intestinal roentgenogram was negative. The medication which gave him definite relief was atropine. A diagnosis of spastic colon was made.

Case 4: Abdominal pain. Chronic appendicitis. Presented by Dr. R. E. Pray.

This little girl is 11 and starting three years ago, associated with a sore throat, she had pain in the right lower quadrant. At that time her white blood count was 19,000 but she had a definite follicular tonsillitis and also ran Grade II pus in the urine, which was rather stubborn to clear up. She has had influenza on two occasions and associated with it there has been abdominal discomfort, although the white blood

count has never been up since the first attack. She has a good deal of trouble with constipation. The only vomiting attacks have been associated with the sore throat. She is now a well developed child and if it were not for these recurrent attacks of abdominal pain the mother would not be much concerned about her condition. This case we have called chronic appendicitis.

Dr. Robb: I am very glad to show these two children who were brought in complaining of abdominal pain, for this is possibly the most common presenting symptom we have with children and one which causes us no little concern. You realize there are many things to consider and we must decide promptly whether or not we are dealing with a surgical condition. Delay in diagnosing a medical condition will probably lead to no serious consequences, but delay in diagnosis of a surgical condition may be disastrous.

Children present a somewhat different problem than the adult in that practically any illness in a child may start with nausea, vomiting and abdominal pain. A careful history and physical examination is of the utmost importance, for ruling out medical conditions. Oncoming tonsillitis, bronchitis, otitis media, enlarged mesenteric glands, scarlet fever, simple food upsets, so-called "intestinal flu" etc., may be easily confused with an acute abdomen. A urinalysis should always be made as a bladder or kidney infection is also a frequent cause of abdominal pain and rather common, particularly in girls.

Probably the most common abdominal pains, however, are hunger pains, and they are found chiefly in the high strung, nervous type of child with a poor appetite. These children usually come from families of the middle or upper classes where faulty feeding habits have started as infants and increased with time. These faulty habits are almost sure to develop where a child receives much attention during meal time. Nothing contributes so heavily to a poor appetite and a nervous disposition in a child, as the concern shown by a fond family over the amount of food taken by the child. Children in orphan homes, and other institutions, seldom have poor appetites and hunger pains simply because they are given plain foods and the responsibility of taking it is checked squarely up to them. If a child find that no fuss is going to be made over him no matter how little he eats, he will eat.

We recently saw a boy five years of age, who gave a history of indefinite abdominal pain during the past two years. Two days before admission he had had more severe pain, had vomited once or twice and had a slight temperature. Upon admission, he was found to be definitely tender over the abdomen and there was muscle spasm on the right side a little above McBurney's point. His temperature was 101° F., and the leukocyte count was 18,000. A diagnosis of acute appendicitis was made. At operation, the appendix was found to be perfectly normal but a perforating gastric ulcer was found. This is the only case of gastric ulcer I have seen. Undoubtedly gastric and duodenal ulcer are not common; however, they may well be more common than we now think.

Of acute surgical conditions of the abdomen, appendicitis is the most frequent and the most treacherous. Because of the small amount of muscle tissue in the appendix of a child, they rupture quickly and because of the short omentum, a generalized peritonitis is more apt to result than in the adult. Any child with acute abdominal pain should at least be suspected of having appendicitis and a conscientious endeavor made to make a prompt diagnosis. While none of us want to see unnecessary surgery done, it would be better to occasionally take out a normal or near normal appendix than to delay too long and find a ruptured appendix with a generalized peritonitis. The symptoms of appendicitis, of course, vary in degree. Most children vomit two or three times. Pain is always present, but the amount of pain is often difficult to determine. Localized tenderness and spasm are of the greatest importance but are often also difficult to evaluate. The stools are usually normal or constipated although diarrhea is occasionally present. The leukocyte count may or may not be of great aid in diagnosis. In typical cases, the leukocytes are increased up to twelve or eighteen thousand but in many clear-cut cases the count is found to be normal or below normal. An increase of polymorphonuclear cells is probably of greater significance than the cell count inself.

I am unable to make out any evidence of ulcer in the roentgenograms of this boy and believe that the apparent spasmodic pains that he has can be eliminated by attention to his diet and eating habits.

The attacks of pain in the little girl seem to be rather closely associated with the appearance of upper respiratory infections. However, the localization of her pain is such that she might well have a low-grade recurring appendicitis; a fecalith or some old adhesions may be present. She should be closely watched and the mother cautioned to call for help at once if she should have a more severe attack.

Case 5: Little's Disease. Presented by Dr. P. H. Woutat for Dr. Williamson.

This child is 10½ months old, and was delivered of a toxic mother. The birth weight was four and a half pounds. Labor was difficult and forceps were used. Because of the mother's condition there was no breast feeding and the food problem was difficult. The child was cyanotic for several days, listless and drowsy. The whole progress of the case was slow. The gain in weight was slow but steady and as time went on the condition improved until about the age of two months. At that time definite evidences of spasticity of the legs was noted and the child did not improve mentally as one would expect. The reflexes were hyperactive. Calcium gluconate was given without response, and the condition remained about the same until the age of 9½ months when nutritional disturbances developed and the spasticity became more severe. At one year the child did not do well, the weight was low, the spasticity in the legs was more marked and the mentality was not normal. We did not see the child again until two months ago. Then he could not sit up and when he attempted to walk there was a scissors gait.

Dr. Robb: This is of course a typical case of Little's disease due to intracranial hemorrhage at birth, either from trauma or from hemorrhagic disease of the newborn. The degree of impairment of mentality and severity of paralysis depends upon the amount of brain injury sustained. Apparently in this case the brain injury had been extensive. This is indicated by the lack of mental development, inability to sit or stand, the marked spasticity of muscles, and so on. Injuries may occur in normal deliveries as well as in the difficult forceps deliveries. During recent years, however, the number of these cases has definitely decreased, due in part to better obstetrical technic and in part to early recognition and treatment of hemorrhagic disease of the newborn. Hemorrhagic disease is not to be confused with birth trauma. It is a distinct disease characterized chiefly by a tendency to hemorrhage, not only in the brain tissue but from any of the mucous membranes of the body. A diagnosis is readily made by determining the bleeding and coagulation time. As many of you know, Dr. Rodda several years ago devised a very simple procedure for this determination, and one which is widely used in newborn wards as a routine procedure. If the bleeding and clotting time is found to be above normal, subcutaneous injections of whole blood will as a rule rapidly correct the condition.

Unquestionably, many infants have small intracranial hemorrhages that cause no permanent damage, others with more severe hemorrhages may show physical defects with little or no mental impairment. In these, a great deal can be done by muscle training, orthopedic procedures, and so forth. Where the damage has been great, little or nothing can be done and fortunately most of these little victims succumb early to intercurrent infections. If in these more severe cases the children live, they are probably better off if placed in an institution, particularly if there are other children in the family, as they will be happy and comfortable no matter where they are and they do have a decidedly unhappy influence on normal children in a household.

Cases 6 and 7: Eczema. Presented by Dr. R. E. Pray.

In this first case everything was all right with the child until we started cereal feeding, and then the dermatitis developed. It did not cause any particular bother until it began to localize around the eyes. We have changed to ripe bananas and the child takes them well. Also, viosterol or cod liver oil cannot be given without producing a rash.

This child, Dicky, started in with a definite cradle cap and eczema began to spread over the body. The only important thing in the history was that Karo was used in the diet. We have seen a number of cases definitely aggravated by Karo. This boy did not entirely respond but was better when he was taken off this preparation. At present he is in good condition and his mother knows that whenever he can have sunshine he is much better, but ultraviolet therapy does not have the same effect. We had difficulty in keeping the hemoglobin up until the last year but now he is in good condition. There is nothing particular in the diet except tomatoes and cod liver oil, which surely aggravate the condition.

Dr. Robb: The general physical condition of these children is good. They are both quite normal except for mild facial eczemas. Very definite progress has been made in the past few years in the treatment of these cases. We seldom see the horrible cases that were so common ten years ago. This has come about by an improvement in infant feeding as a whole, by a better understanding of the relationship of allergy to these cases and by a realization that various lotions and ointments do little good unless all the other angles of the case are considered and regulated at the same time.

Infantile eczema is due to an underlying idiosyncrasy to some foreign protein. This may

be a food protein or it may be any one of many external proteins, such as dog hair, cat hair, chicken feathers, wool, etc. It tends to run in certain families and is closely related to other allergic manifestations.

Eczema, in breast fed babies, is apparently often due to certain foods in the mother's diet and is difficult to cure unless these foods can be eliminated. In severe cases, it is sometimes necessary to wean a baby in order to better control the feeding. This should be done only after all other measures fail, and should be done slowly; the breast milk supply should be kept up for a time by expression in case it seems wise to return to breast feeding. My experience with skin testing has neither been large nor particularly satisfactory. I wish Dr. Balyeat, who is present, would discuss these cases for us, particularly with regard to the allergic angle. We have occasionally obtained some valuable help from the skin tests but my best results seem to come when I have the complete co-operation of an intelligent mother, adding only one new food at a time, beginning with a small amount, increasing slowly and watching carefully for any allergic manifestations. This procedure, which is the one commonly followed in infant feeding today, accounts I believe, in great part for the smaller number of severe eczema cases.

Cow's milk is of course the natural substitute for breast milk and it has always been the custom to use low fat mixtures. Dr. Arild Hanson of the University of Minnesota recently published a report, however, that may change this conception. He found that the use of tar ointments as a local treatment increased the amount of unsaturated fatty acids in the blood stream. Since it is well known that tar preparations have given as a whole better results than other local treatments, he points out that the addition of fats, such as Mazola oil, to the diet may be beneficial. Goat's milk feedings have been used with success but it is often difficult to obtain, is expensive and if given over long periods, often leads to severe anemia. Powdered milk preparations, such as Mead's or Klim, powdered whole milk or skimmed milk are usually better than fresh milk preparations in these cases. In those cases extremely allergic to cow's milk, it is sometimes wise to eliminate milk in any form from the diet. This can be done easily in older children, but calcium and other constituents of milk must be given to meet the needs of a growing child. Milk-free preparations, such as "Mead's Sobee" may be used in younger children.

Local treatment consists of a wide variety of lotions, ointments, and so on, everyone having a few favorite remedies. In general, the dry type does better if treated with a preparation having a vaselin or other oil base, while moist or weeping types are best treated with drying preparations containing zinc oxide. One commonly used is made up of equal parts of zinc oxide, talcum, glycerine and water. As previously mentioned, crude tar preparations give, as a rule, the most satisfactory results in most cases. They have, however, some obvious disadvantages; they soil not only the patient' clothing, but the mother's and everything else that comes in contact with the child. A mixture of equal parts crude tar, acetone and collodion, when painted on, dries and stays on better than tar ointments. If large areas are involved, only a portion of the area should be treated at first as a wide application may cause a severe general reaction. If when first seen, the patient is covered with crusts and the lesions are of the weeping bleeding type, wet applications, such as a weak Burrough's sollution, are advisable to clean up the skin before applying other treatment.

Care of the general condition is as important as local treatment. The skin should be cleaned with oil. Water, soap, wool, silk and other irritants should be kept away from the skin, and scratching must be prevented by the use of cuffs, pinning down of the hands, and so forth.

Discussion

Dr. Ray Morton Balyeat, (Oklahoma City, Okla.): The first thing I would be interested in, in these cases, is the question of inheritance—whether there are any sick headaches, urticarias, or eczemas in the family tree. This mother says that there is no history of any of these diseases in her family. However, sometimes it is difficult for a mother to know. For example, her mother may have had eczema severely as a baby and yet if her mother has passed on there would be no way of obtaining that history.

In one of these cases I think that what wheat might be an underlying factor. This is quite a common cause of eczema. But of all the foods that cause eczema, egg is the most common offender. The smallest quantity of egg, in the diet of a child who is extremely sensitive to egg, will cause trouble. It is very common to have patients who are sensitive to egg and who have been advised to leave egg out of their diet to take food which contains egg and continue to have trouble. I should say that wheat ranks second in importance as a causative factor, and milk third. In the case of headaches, as a rule, milk is first in importance as a causative factor.

In the case of gastro-intestinal symptoms, wheat is usually first as an important factor in the cause of difficulty. In a child who is sensitive to egg, the amount of egg that would come down through the mother's milk supply, if she is taking egg in her diet, would be sufficient to cause allergic symptoms, whether eczema or other allergic manifestations.

By no means is food the only allergic cause of eczema in children. In the territory in which I live, contact dermatitis due to the oil from the ragweed leaf or oil from the Bermuda grass blade, is a common cause of allergic dermatitis in children. In any territory, wool or silk are common offenders. We have seen a case of dermatitis in a child recently, due to cattle hair. Goat hair is not an uncommon cause as it is used extensively as a covering for overstuffed furniture and also is used for the moderate priced doll hair.

It is interesting to note that in contact dermatitis there need not be any allergic background, but an eczema, coming from food, almost of necessity must have a history of allergy in the family.

I am a firm believer in considering carefully the family tree. If the family tree is saturated with allergy and the patient comes in with some unusual condition, for which a cause cannot be found, certainly allergy must be thought of. For example, if a child is brought in with some form of dermatitis and the family tree is saturated with allergy, allergy is the most logical cause of that child's dermatitis. If a child comes in with abdominal cramps, periodically, and the family tree is saturated, food sensitization should be taken into consideration.

I appreciate the opportunity of discussing these cases.

Case 8: Congenital Syphilis. Presented by Dr. W. E. G. Lancaster.

Baby A., is now 13 months old and she was first brought in at about one month of age on account of a skin eruption. The mother first noticed the eruption on the buttocks and about the same time the palms and soles were beginning to peel. The eruption next appeared on the forehead, face, chin and hands, the trunk and lower extremities remaining free. On the buttocks and face the eruption appeared like small ulcers and those on the buttock had a punched-out appearance. On the forehead, the lesions were circinate.

The Wassermann and Kahn tests were both 4+. Other laboratory tests were negative. The child was placed on stovarsal by mouth. The plan of treatment was divided into periods and during the first period of seven days she received 1/13 gr. per kilo daily; during the second period of seven days 1/7 gr. per kilo daily; during the third period of seven days 1/4 gr. per kilo daily; during the fourth period of seven days 1/3 gr. per kilo daily; and during the fifth period of thirty-five days 1/3 gr. per kilo daily. Then a sixth period of six weeks rest was given.

Three weeks after treatment was begun all the skin lesions had cleared. About the seventh week of treatment, the child developed a severe diarrhea and was immediately taken off stovarsal and the lesions cleared up after a week, without the use of sodium thiosulphate. The Wassermann and Kahn reactions became negative after a few months and have remained so. At present, there are no physical findings.

Dr. Robb: The results of treatment in this case have been most gratifying. Great progress has been made in the treatment of syphilis in general, not so much in the babies after they arrive as in the prenatal treatment of the mother. Any mother who has syphilis should have anti-syphilitic treatment during pregnancy. If this is carried out in strenuous fashion, the baby will probably escape. Most of the cases we see now look normal in every way during the first few weeks of life. The first symptoms are the coryza and then the rash, but they are much milder than formerly. The later manifestations of the disease are well known, and as our time is up I will say only a few words with regard to treatment.

In the treatment my feeling is, that, knowing the end-results of syphilis as well as we do, if we are going to make an error, we should overtreat rather than undertreat. The first thing is to definitely establish the diagnosis. Often children are given two or three injections, the condition clears up and no further treatment is given for several years, until further symptoms develop. If you cannot make a definite diagnosis, it is better not to give any treatment. The cards should be put on the table in the beginning; the whole story should be told to the parents. They should understand thoroughly that the treatment will take time, that there is some hazard and some expense connected with it; if this is done we will have better results.

There is no question that the arsenicals are the best for the treatment. Intravenous therapy is difficult and is not, as a rule, used in young children. Sulpharsphenamine can be used intramuscularly very well. Stovarsal by mouth has

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Tuberculosis Survey of the State Normal School at Bellingham, Washington

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The purpose of a tuberculosis survey of a school is threefold.

1. To determine which students have been infected by the tubercle bacilli and of those infected, which ones have clinical disease.
2. To transmit to the students information regarding tuberculosis.
3. To trace the reactors back to the source of infection and find the spreaders.

The Normal School at Bellingham was chosen by the committee because here we had a large group of young adults who were under considerable strain as pupils and who, therefore, should know if their bodies have been invaded by the tubercle bacillus, and the protective measures indicated. We chose the Normal School also because of the splendid opportunity to aid the tuberculosis cause by educational means. If these embryo teachers could be impressed with the value of a Tuberculosis Survey, then later as teachers they would be in a position to give the tuberculosis campaign valuable aid. Preparation is a very vital part of the tuberculous survey. Successful warfare against this disease requires cooperation of all organizations interested in health work. The Tuberculosis Committee laid the foundation for the survey with careful preparation. We asked and received from the Washington Tuberculosis Association splendid co-operation. The Whatcom County Medical Society extended their full support. With these two organizations working in harmony with us, we contacted the Normal School through President Fisher and obtained its enthusiastic aid. A special assembly was called for all students at the Normal School at which time President Fisher spoke on the importance of good health and asked the students to take advantage of this opportunity for a check-up on tuberculosis. Mrs. Earle Thornton of the Washington Tuberculosis Association gave a general health talk and stressed the importance of knowing if infection had occurred and if it had been followed by clinical disease. A member of the committee spoke on tuberculous infection, explaining when and how it may occur and how its presence can be determined. He also discussed clinical tuberculosis, explaining when and how it may occur and how its presence may be determined. A chart was shown illustrating a tuberculin reaction. This chart is marked, "The First Step—used for screening out all those infected by the tubercle bacillus." Another chart was shown illustrating an X-ray film with a tuberculous lesion of the lung. This chart is marked, "The Second Step—used for determining which of the reactors have manifest tuberculosis." Questionnaires were then passed out and valuable information was obtained on family history, previous and present history, etc. Slips were issued for signatures of parents giving permission for the tests. Later numerous personal interviews were given by Mrs. Thornton and members of the faculty to help the students complete their questionnaires and prepare for the examinations.

That this preparatory work was of real value was proved by the fact that 87.7 per cent asked for the skin test. A few had been done before, therefore, 90 per cent of the students were tested.

The First Step in the examination. Dr. Seth Cox of the Washington Tuberculosis Association, and also a member of our committee, who has made over eighteen thousand skin tests in the last two and one-half year, did this part of the work for us. A number of the physicians watched Dr. Cox make the tests and interpret the reactions 48 hours later. The keen interest shown by the doctors in the survey was very gratifying since it pointed toward the day when the profession, as a whole, will recognize this procedure as the most important steps yet devised toward the control of tuberculosis. Results of the skin test: four hundred and sixty-four persons were tested whose average age was 19½ years. Twenty-seven and five tenths per cent proved to be reactors. Fifty per cent of these reactors gave a definite history of contact with cases of tuberculosis.

The Second Step in the examination was to determine how many of the reactors gave evidence of clinical tuberculosis. The best single method for that procedure is the X-ray film. As Dr. J. Arthur Myers has stated, a tuberculous lesion will frequently be revealed in the X-ray film weeks, months, or even years before the individual is aware of any symptoms or presents

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any signs on physical examination. Every effort was made to have all reactors X-rayed. The Bellingham physicians gave a low rate for the X-ray work. The Normal School paid for the films from the Students' Health fund.

Out of the 128 reactors, 115 were X-rayed. The films were read by committee members, assisted by roentgenologists, Dr. F. B. Exner of Bellingham and Dr. Carl Koenig of Seattle, with the following results. Ten per cent of the reactors revealed abnormal X-ray shadows interpreted as due to tuberculosis of the lungs. Three suspicious cases were found. Three early cases. Two apparently healed cases. Three fibroid cases. All reactors are to receive a physical examination. Forty have already been done by Dr. Cox and the remainder will be done this fall when the students return to school.

The following advice was given by the committee after this part of the survey was completed.

1. The non-reactors or 72 per cent of the student body should have a yearly skin test.
2. Reactors showing no evidence of clinical disease by X-ray, history or physical examination must break any contact with known cases of tuberculosis. They should follow good living habits and have a yearly examination which must include an X-ray.
3. Reactors showing definite evidence of tuberculosis of the lungs must be kept under close supervision by the family physician with frequent physical and X-ray examinations to determine the proper care of each individual case.

If the plan of this survey were uniformly carried out in all our schools and colleges we should soon find and recognize cases at a time when they are amenable to treatment and before others are infected. As it is now over 80 per cent of the cases who come to us because they feel ill, are already moderately or far-advanced and have infected others.

Pediatrics

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been used with good results in many instances, but it has two possible unhappy complications. It is apt to cause diarrhea or nephritis. Next to arsenicals, bismuth preparations probably give the best results. Mercury has been largely pushed into the background.

No child with syphilis should be under treatment without being seen by the physician at least once a week. General care is as important in these cases as anything else and the children should be under close observation and control. The treatment can be varied as occasion arises. If the Wassermann reaction is still positive after one and a half to two years of treatment, stop all treatment for six months or a year and then give another course. Some say that congenital syphilis cannot be cured, but we see many patients that go along for years with no symptoms whatsoever and it is fair to assume that they are cured.

Venereal Diseases During the Depression

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SYPHILIS and gonorrhea are contagious diseases and are subject to epidemiological investigations and control as are other contagious diseases. A person who has a venereal disease is simply unfortunate, and he should not be persecuted or despised any more than one who has diphtheria; both are sick and should be treated with consideration. Moreover, both the venereal diseases and diphtheria require immediate treatment, for if the treatment is not given at once it may be too late to prevent permanent disability. To allow these people to wander about without control or treatment is to endanger the community as well as the individual.

Because venereal diseases are spread almost entirely through sex contacts, the epidemiology of these diseases is intimately related to the science of sociology, and to investigate their spread one must study social conditions causing aberrations in sex control.

A financial depression such as we are now experiencing can be expected to disrupt the usual routine of living in a community because there is much unemployment, which results in idleness, mediocre conduct, and a lowering of the standards of living. As a last resort, many turn to vice, prostitution, and crime to obtain money.

Besides those entirely out of work, there are thousands of persons in each city who have received pay-cuts, yet their living expenses remain as high as ever. It is to be expected that many of these will try to acquire extra money by easy means.

Many married women are forced to work now, but the combined salary of husband and wife is not as great as the one he formerly earned. When our young men and women see this, that natural biologic event, marriage, is postponed; when early marriage is delayed, illicit sex experience is almost inevitable.

The effects of a long continued economic depression are not easily seen. For example, an increase in poverty increases the opportunities for promiscuous relations by causing crowding into small, closely packed apartments, so that barriers are lowered. There is a loss of social self-respect, and standards of personal hygiene are gradually forgotten. Crowding is often so intense that several families occupy the same apartment, and even different sexes the same bed.

In search for work, girls are drifting into the larger cities; each refusal of a job means just so much loss of morale. Such girls may have had an occasional sex experience in the past which makes it less difficult for them to adopt prostitution as a means of livelihood. Many of these girls would never think of doing such a thing in their home towns, but among strangers they can find nothing else to do. Since these girls are more naive, evidently new to the game, they add a certain amount of "quality" to the business; at least they may appear more desirable than the experienced prostitute.

The young women drift into such jobs as waitress, maid, cigarette-girl, or hostess at cheap hotels, speakeasies, dancehalls, and cabarets. They come under the control of gangsters and male go-betweens, who have also drifted into the work because of unemployment or a natural vicious tendency. At these places the girls are expected to be as "sexy" as possible, and, naturally, they receive many sex approaches from customers. There has geen a great slump in the dance-hall and other amusement trades so that girls must pick up money on the side. One must live somehow, and, generally, there are relatives back home who need help.

Today there are so many nice things that money can buy.

The business of the prostitute has suffered so much by an increase in competition that many houses of prostitution have had to close, thereby throwing the prostitutes out on the streets on their own initiative. It is no secret to most of us that a man can scarcely walk down the street alone in the evening without receiving several propositions or highsigns. Window tapping is common.

Young men now say that it is as easy to obtain sex contacts as it is to obtain the new three-two beer. Girls they know seem to think no more of the sex relations than they do of the ordinary handshake, and they offer either as readily. Many venture to say that they can make relations with nine out of ten girls who come to the dance-halls

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they attend; they further add that they know of numerous friends who have received a "dose" from these girls. But these young men emphasize that the young girl or woman with a home is as "moral" today as she ever was, but the one without a home or parental guidance, or any means of support, is a "sure-thing."

When we talk confidentially to the women who attend our venereal disease clinics we learn that they have no other way of obtaining money; stealing is too dangerous and risky!

The police and social workers are most emphatic in stating that there has been a great increase in prostitution and loose moral living. Women who in the past "came through" as a special favor for a dinner or dance are now actively engaged in securing "loans" to pay for rent and clothing. It has been found expedient by many unattached girls to move in with a man to make the cost of living cheaper for both, it being understood that the arrangement may be terminated at any time.

Today everyone is in such a hurry, in such a nervous tension, intent on getting all the thrills possible out of life, that one has not the time to develop poise and constraint. Since Sex today seems to be the Pulse of Thought, it may be expected that sex contacts are more easily made than formerly, and that the incidence of venereal disease has increased.

In a personal communication Dr. Taliaferro Clark, Assistant Surgeon General, U.S.P.H.S., wrote: "Results of a 1930 resurvey of 16 communities in which a one-day census of venereal disease had been made in 1927 revealed that there is an increase in the number of persons seeking treatment for syphilis in the public clinic. Data have been assembled by the American Social Hygiene Association which reveal that not more than fifty per cent of the venereally-infected population seek treatment. This finding has been borne out by the U.S.P.H.S. In incidence studies it was found that fifty per cent of those who did come for treatment had neglected their infection until after it had reached the chronic stage."

Statistics show that the venereal diseases are increasing in the United States. This greater incidence may be due to the fact that a greater percentage of the patients are attending the public clinics now; it is well known that public clinics report *all* their new cases, while private physicians are notoriously lax in reporting their cases. As the accompanying table shows, the public clinics reported one-half of all the new cases reported in 1929 in Minneapolis, while they reported three-fourths of all the cases reported in 1933. The private physicians are losing the venereal disease work. Today, private physicians in Minneapolis are reporting thirty-six per cent fewer cases of syphilis (and also of gonorrhea) than they reported in 1928.

When one looks at the individual reports one finds that most of the reports come from a small group of conscientious men. Many so-called "big-men" in dermatology and syphilogy never report a case, whereas they see more cases than most physicians. The attitude of aloofness shown generally by the medical profession toward the prevention of the venereal diseases is largely due to the poor example set by these men who ought to be outstanding leaders in epidemiology. Although more new cases of venereal disease are being reported each year in the United States as a whole, fewer cases are being reported in the State of Minnesota. From this we may conclude that the physicians of this state are more lax in reporting cases than are physicians elsewhere.

An examination of the Minneapolis death certificates of 1932 disclosed that private physicians reported only thirty per cent of the deaths reported as being due to syphilis. The coroner reported an additional nine per cent in persons who died on the streets because of luetic aortitis and aneurysm. The Minneapolis General Hospital alone reported fifty-two per cent of all the deaths reported as being due to syphilis; this great percentage is not due to a greater prevalence of syphilis in patients attending this charity hospital, but is due to the fact that every patient who

VENEREAL DISEASES IN MINNEAPOLIS

SYPHILIS	1929	1930	1931	1932	1933
Total of new cases reported in Minneapolis.	1,063	1,167	1,211	1,234	1,156
New cases reported by private physicians	580	583	467	415	371
New cases reported by public clinics	483	584	744	819	785
Per cent of new cases reported by public clinics	45	50	61	66	68
Incidence of new reported cases per 1,000 population	2.3	2.5	2.5	2.6	2.3
Deaths reported by death certificates	54	57	50	57	84
Rate of reported deaths per 100,000 population	12.0	12.4	10.0	11.9	17.1
Population	455,000	464,000	474,000	481,000	489,000

GONORRHEA	1929	1930	1931	1932	1933
Total of new cases reported in Minneapolis.	1,949	1,896	1,792	1,599	1,514
New cases reported by private physicians	1,370	1,264	1,089	888	874
New cases reported by public clinics	579	632	703	711	640
Per cent of new cases reported by public clinics	29	32	38	44	42
Incidence of new reported cases per 1,000 population	4.3	4.1	3.8	3.3	3.1
Deaths reported by death certificates	7	7	2	7	4
Rate of reported deaths per 100,000 population	1.5	1.5	0.4	1.4	0.8
Population	455,000	464,000	474,000	481,000	489,000

enters this hospital, no matter for what cause, is examined routinely by the Wassermann test, and more than fifty per cent of those who die there are examined by autopsy. Private physicians do not use the Wassermann test routinely, as they ought, and many, no doubt, are influenced by the wishes of the family to hide the true cause of death so as to keep the family's name clean, or to prevent trouble collecting life insurance.

The examination of death certificates further disclosed that 2.6 per cent of all deaths that occurred at this hospital were due to syphilis. During the present economic depression patients from nearly all walks of life have been forced to go to this hospital for charity aid; we may say, therefore, that this hospital is at present fairly representative of the entire city. If 2.6 per cent of all the deaths in Minneapolis were really caused by syphilis, 135 persons should have been reported as dying in 1932 from syphilis. Only 57 persons, or one-third of the probable number, were so reported, however.

As stated, every case that enters this hospital for whatever cause receives a Wassermann test routinely. A careful check of the Wassermann reports to exclude repeated Wassermanns on the same persons showed that 9.2 per cent of all the patients that entered this hospital in 1932 had syphilis. This agrees fairly well with similar studies done in New York City and New York State, where from 10 to 12 per cent of the population was estimated to have syphilis. At this rate, some 45,000 persons in Minneapolis, and some 260,000 in the entire State of Minnesota, have syphilis. Only 4,000 new cases of syphilis are being reported each year in Minnesota, and more than one-third of these are being reported from Minneapolis alone. From this it would appear that very little work is being done to combat the venereal diseases, and most of this work is being done in the larger cities of the state.

But why are we doing so little? The answer is chiefly: it costs money. A stigma of shame surrounds the entire subject so that few wish to discuss it. Lay persons in charge of budgets are loath to set aside money for the work because they do not appreciate its value.

It costs quite a good deal of money to treat a case of syphilis. Most of the private physician's fee is made up by the high cost of the drugs used. Since a physician's overhead is 40 to 50 per cent of his gross income, he is certainly losing money if he cuts his price in half, as he is so often asked to do. He does more charity work than any other professional man would think of doing. The rates charged by private physicians are generally as low as they can make them. But during the present economic depression we find that they are not low enough, even so. There is the other side of the problem: how well can the patient afford to pay for treatments? Certain special considerations arise that affect the ability of the patient to pay for venereal disease treatment:

(1) The treatment takes a long time. A thorough treatment for syphilis takes about three years, at a total cost of $500 to $600 at minimum private physician rates. When complications occur, costs mount rapidly. It should be remembered that the patient's ability to pay for the first few injections of arsphenamine is no criterion of his ability to pay likewise for the full course of treatment.

(2) Only one salary is available. Because of the secrecy and shame associated with venereal diseases, the patient cannot tell his relatives and ask for aid, as he could if he had a broken leg. He can use only his own salary.

(3) Venereal diseases are acquired early in life. About 60 to 75 per cent of all syphilis cases are reported as being in the age group 16 to 30 years, a period in which the patient has not yet had time to build up an earning capacity. It is natural for him, therefore, particularly when he or she is young and not aware of the seriousness of the disease, to postpone treatment. He loses his one big opportunity to stamp out his disease before permanent harm is done. Later in life, after he has saved some money, and perhaps made a name for himself, he would give anything to go back to this early period of his life to receive treatment; but then it is too late.

(4) The symptoms and distress soon leave after treatment is started. The patient is lulled into a feeling of security. He loses the enthusiasm or the fear which first drove him to be treated. He gradually believes that the physician who asks him to continue to come for treatment is doing so merely to make more money. This is probably the reason why private physicians do not give as long or as thorough treatments as do the public clinics; private physicians do not have the same control over their patients. The one control they do possess, that of reporting the case as delinquent to the Health Department, they do not use lest the patient believe that he is being persecuted for failure to pay bills.

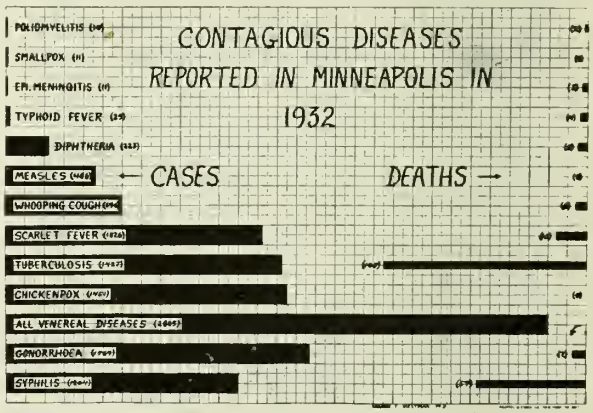
(5) Quacks and drug stores sell "cures" for self-medication. This business is thought to be large. A great deal of misinformation is received from these sources, valuable time is lost, and much of the patient's money has been squandered before

he comes to the physician who can be of service to him.

(6) The costs of venereal treatments, about $300 or so the first year in the case of syphilis, cut deeply into the yearly salary. It was estimated that three-fourths of the country's population received a salary beween one and two thousand dollars in 1928. One year's treatment would be 15 to 30 per cent of his salary, to meet which the patient would have to skimp strenuously on clothes, food, furniture, recreation and rent. The patient cannot spend this large sum of money without being questioned by husband or wife. When these questions arise treatment is stopped in order that his secret infection and treatment may continue to be a secret. If the patient had so much difficulty before the depression, it is easy to see how impossible it is for him now to pay for treatment.

(7) A number of physicians do not know how to treat the venereal diseases properly. Modern methods of diagnosis, such as the dark-field microscope, the Wassermann test, and the spinal puncture are but imperfectly understood. Little emphasis is made on the diagnosis and treatment of the venereal diseases in our medical schools, for these diseases are generally buried in the study of dermatology, than which many students believe there is no more distasteful or less understood subject. The medical student receives the impression that the specialists who teach there wish only to show how intricate it all is, and that the general practitioner ought, therefore, to send his patients to the specialist rather than fool with them himself. The venereal diseases are so prevalent and so protean in symptoms that they rightly belong in the domain of the general practitioner, except, perhaps, tertiary and quarternary forms that may require the attention of a specialist. The treatment of the venereal diseases is generally simple, but far too many physicians do not know how long they should continue treatment; many "take a crack" at treatment by giving a few "shots" of something or other, and a few months later, when the Wassermann test is negative, the patient is declared cured, the treatment is stopped, and the patient is allowed to go home to develop tabes or paresis, and to have syphilitic children. There is a tendency to use new fads in diagnosis and treatment; the detail man has taken on the role of teacher. Fads are expensive and tend to cause loss of confidence in the physician and in the treatment. Many physicians, as well as most patients, do not seem to realize that the full treatment requires at least 35 doses of arsphenamine, and that it lasts almost three years. Moreover, the high cost of the necessary drugs puts pressure on both physician and patient, which neither can help, so that the treatment becomes irregular or is prematurely stopped. Most of us need post-graduate study in syphilology. Osler once said that "he who knows syphilis knows Medicine."

The subject: The ability of the patient to pay for the treatment of syphilis, has been well presented by Michael M. Davis in the Oct., 1932, issue of the Journal of Social Hygiene.



The accompanying bar-graph shows the relative importance of the venereal diseases as compared to the other contagious diseases. It is seen that almost as many cases of syphilis are reported in Minneapolis as cases of tuberculosis, and the deaths from the two diseases are about the same, it being remembered that syphilis is the great camouflager, hiding behind other diagnoses. In the country as a whole more cases of venereal disease (combined) are reported then any other contagious disease except measles.

Tuberculosis and syphilis have many points of similarity. Both are chronic diseases that reach back into the last generation and forward into the next. The treatment of both takes a long time and considerable money, and both have a high mortality. Neither of these can be prevented by vaccination, nor does an antitoxin exist against them. Both are difficult to diagnose, and are often not recognized until late in the disease. Both are costly to the state by using many beds in public institutions for the incurable tuberculous and the syphilitic insane. Both have periods of latency during which there are no symptoms and so treatment is neglected, and both may suddenly become actively destructive and communicable. Microscopically and macroscopically, many lesions are alike. Both may be controlled most easily in the early stages; to neglect treatment of either results in irreparable harm. Moreover, up to very recent years, tuberculosis was considered to

be a very shameful and secret disease, and is even somewhat so today.

We have been very busy in eradicating tuberculosis—and we have done very well, indeed—but we have forgotten the venereal diseases by the road-side, even though as important as tuberculosis. Although tuberculosis and the venereal diseases have many points in similarity, they differ in that the treatment of the venereal diseases can be made very simple and ambulatory at very little cost, even in the late stages. Big sanatoria and intricate operations are not necessary; all that is needed are the services of physicians, proper drugs, and a few hypodermic syringes and needles. Hence, present-day tuberculosis associations and follow-up workers could easily direct this work in addition, if there were cash to finance it. It would not be hard to graft venereal disease work upon the structure built to fight tuberculosis, or to pattern a structure similar to it. We could even have Christmas seals to help finance venereal disease control.

Of course, the practising physician is the ultimate health officer, but we can not leave everything to him. By the nature of his work he is an individualist, and a very busy man, so the epidemiological work must be left to a central body such as a health department. The physician will do his bit of the epidemiological work by reporting the case and the source as well, just as he does with cases of tuberculosis. The private physician may as well see the handwriting on the wall: if he doesn't begin to take an active part in the prevention of the venereal diseases, the work will be taken away from him by state agencies. There is so much work to do that full co-operation must be had from everyone practising medicine.

In starting a program of venereal disease prevention, we recognize, first of all, that the syphilitic is a menace to no one if he is treated early, is isolated for a short time while in the early infectious stage, and is treated continuously for about three years. Ambulatory treatments are the rule.

The time is rapidly approaching when the State must subsidize venereal disease work, just as it is subsidizing tuberculosis work. When the State decides to furnish the necessary money, two methods of using it seem feasible:

The first method is essentially a form of State Medicine. The state would create clinics in the larger cities operated by local physicians paid by the state. The cost to the patient would be small. In the rural districts, where distance is important, traveling clinics (which might do tuberculosis work at the same time), created around the county health department, would conduct diagnostic surveys and give treatments at regular intervals.

In contrast to this is the private physician plus state aid plan. The private physician chosen by the patient treats the case individually as he does now, but a minimum amount of treatment, at least, must be had as prescribed by the state before the case is declared cured. All specific drugs would be furnished free to the physician as is done with diphtheria antitoxin, without requiring the physician to declare that he is going to use these drugs only on indigent patients. The state can buy these drugs cheaply in large quantities. The physician will not charge the patient for the drugs, but only for his services. When the patient is unable to pay even this small amount, the state will pay the physician a reasonable fee for his services. Follow-up workers will be organized to work from the offices of private physicians, the work being supervised by local health departments. The second plan appears to be preferable to the first one because (1) it is more convenient for the patient, (2) the treatment is more private and individual, (3) the patient may choose his own physician, (4) it is less expensive for the state over a long period of time, (5) all physicians may participate in the work instead of just a few, and (6) the first plan would bring politics into the choice of the clinic physicians, which is not desirable. A combination of the two plans will be used, no doubt.

Some method of taking care of the prostitute after she has been apprehended should be devised so that she will not go back to this work after she has served her workhouse sentence. It would be better to send her to some kind of preventorium in which the newly recruited prostitute will be taught that she has a place in the scheme of things, that she is really the only one who thinks she amounts to nothing, that she is wanted and needed, and that friendship, children, education, and a successful life may all be hers. Along with this must be some method of getting her a job so that she may support herself and keep her self-respect. At present, she goes to the workhouse: if infected, treatment is started, and at the end of the period of sentence she goes back to the life of a prostitute.

Definite procedures should be mapped out for police officers, and laws passed for the courts to follow, so as to deal effectively with not only the prostitute, but also the procurer and the customer himself. Today, if anything is done, it is against the female and not the male.

Physicians should be required to take a Wassermann test on all expectant mothers, and on all patients that enter hospitals for any cause. A Wassermann test ought to be a requirement for the marriage license.

Basic progress, of course, depends on an alteration in the structure of society, and this is easier said than done. Since prostitution is often due to ignorance, education should help. We have very little sex instruction in our schools, practically none at all. Since prostitution may be the result of natural impulses denied a legitimate expression, a rationalized social life, with aids to those who wish to marry young, may help. Because prostitution is often the result of mental and moral defects, a supervision by the State as a guardian would be necessary to control some. Because prostitution is often caused by bad homes, and low wages, accompanied by alcohol and illegitimacy, progress against prostitution can be obtained by an enlightened statesmanship and an envisioned religion, guided by a new social science and sanitation.

We are now in a period of economic depression, and for many of us it is one of great stress. For those who have a venereal disease it is a very real crisis, indeed. Unless these people receive treatment now it may be forever too late. We must try to induce our State Legislature to take care of this extra load through our physicians and hospitals. There must be no talk of closing the clinics we now have. Our present medical and social agencies must somehow work harder, for this work must be done. Yet we should not expect our physicians and nurses to work for nothing, for charity will eventually fail. Nor should we expect charity from a small group only, when the problem is one that belongs to the entire community. Physicians, especially young ones, who practice among those receiving small, reduced salaries, are already hard hit. We must add to our clinic personnel, and we must pay for what is done, else we will be forcing the physician to compete against himself. It is a peculiar thing about present-day clinics that the entire personnel except the physician is paid something, while the physician who is after all the most important part of the clinic is paid nothing. It is the duty of every city to consider its own venereal disease problem along with the problem of caring for its indigent sick, just as much as it is the city's duty to care for those in need of food and shelter. If these workers are paid who hand out food, why should not those workers be paid who hand out health?

Money spent now for this emergency care of patients with venereal diseases would be a good investment. The lives of many not yet born would be saved. Many would be spared from going to an insane asylum or a pauper's grave. Many would retain their sight and hearing who would otherwise lose them. Numerous deaths from heart disease and other forms of death venereal diseases simulate, and behind which they hide, would be prevented. Unless people are protected now from the venereal diseases, the depression will burn its mark into the lives of the community for the next thirty years or more. *Now* we have the opportunity to save much suffering to mankind and much money to the state by treating persons having a venereal disease. We have done wonders with tuberculosis; we must now attack the equally important and closely allied problem of venereal disease control. If we do not act quickly, the opportunity will have slipped irretrievably from our hands.

Summary

1. Prostitution has increased during the depression.

2. More cases of venereal disease are being reported in the United States as a whole, but fewer cases in the state of Minnesota. Our physicians are lax in reporting.

3. Three-fourths of all the new cases reported are reported by the public clinics; private physicians are losing the venereal disease work.

4. Private physicians fail to diagnose syphilis because they do not use the Wassermann test routinely.

5. About nine per cent of the people in Minneapolis, and probably in Minnesota, have syphilis.

6. The ability of the patient to pay for treatment is touched upon; he is usually unable to pay.

7. The venereal diseases are as prevalent as tuberculosis and cause as many deaths. We must begin active work against the venereal diseases patterned after our program of tuberculosis control.

8. The state must eventually subsidize venereal disease control work; two methods of doing so are given.

Minnesota Plan for the Control of Tuberculosis

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Minn. State Sanatorium

TUBERCULOSIS is a major communicable disease. It is transmitted through infected discharges, more especially positive sputum, to individuals coming into contact with the germ-laden droplets or fomites. These contacts extend beyond the home to public places or other homes, wherever the tuberculous-laden discharge may go. One can easily see the far-reaching possibilities and effect a tuberculosis carrier may have upon a community. In order to insure and maintain the health, not only of the family circle, but also of the community, it is of paramount importance to control this disease. Tuberculosis can be controlled and must be controlled.

In 1931 an epidemiologist was added to the staff of the Minnesota State Sanatorium. It is his duty to act as liaison between the family physician and the sanatorium. The epidemiologist, in co-operation with the county Public Health associations, the Minnesota Public Health Association, and the State Board of Health, is prepared to aid the physician in setting up survey not only among school children and institutions but also among families and communities which have been in contact with open cases. The principles employed are similar to those necessary for the eradication of any communicable disease. In any event, the epidemiologist acts as an instrument to be made use of by the family physician and Health Agencies for the control of the tuberculosis problem in the respective community.

This is an important task and must be handled efficiently. The family physician, with his understanding of the individuals and their community, is best equipped to manage the Public Health Problem caused by the open case. In this scheme the family physician plays an important role. He is the case finder and the epidemiologist of his community. The success of this public health venture falls squarely on his shoulders. He finds and isolates the open case, and then he proceeds to check the contacts for evidences of the disease. It is his duty as a physician to see that once an open case is isolated, there remain no infected contacts. If there are any, these in turn should be placed under the supervision of the doctor.

Our program calls for the whole-hearted support of the physicians. The neglect or indifference of the doctor to handle his public health problem will ultimately lead to non-professional interference. In this way he will allow a lay set-up which will no doubt make inroads not only upon his public health problems but also upon his medical status in the community. It is necessary, therefore, that the physician interest himself in the public health problems as they concern his patients. It is true that at present he will have to make some sacrifice of his time, but in the future when the program becomes well established, the local and state governing boards will look to him, not to the laity, for the proper leadership in the maintaining of this program. At that time the physician will receive ample compensation not only for the materials expended but also for the time which he has given.

Upon the receipt of the reported case from any one of the following sources (State Board of Health, cases uncovered in school surveys, cases reported by family physicians, positive sputum reports from the Board of Health Laboratories, reports on clinical cases discovered in State Hospitals, penal institutions, etc.) two forms are sent to the family physician or to the local health officer. The first is a form letter and the second an epidemiological report card.

When a patient is admitted to the State Sanatorium, the form letter is omitted and the epidemiological form only is sent to the doctor. These forms have been fully explained in the July 1st edition of THE JOURNAL-LANCET, pp. 377 et al.

After the information is obtained, these cards are returned to the sanatorium, where the records are filed in the central filing system. The card contains certain information which is basic to the success of the future follow-up work in the community. The first part asks for names of relatives or associates who are or have been in close contact. There is also space left for age, address, Mantoux and X-ray reports. The second part asks for the relatives or associates, with known pulmonary tuberculosis and their present status.

When all this information is obtained, the cases are considered completed epidemiologically. Here, then, is a complete record of an individual with a communicable disease and the status of all the known contacts. Among the contacts where active cases are revealed they will be isolated

along with the center case in order to prevent them from becoming center cases in themselves. On the other hand, when other findings such as negative Mantoux or positive Mantoux with no adult disease are obtained, the contacts will be followed up.

The central filing system will eventually contain completed information on every open case of tuberculosis in the State of Minnesota. We have at the present time merely made a start. There is much work to be done by our epidemiologist and the family physicians in order to complete this file. The true epidemiological problem will start at that point when the status of every open case and his contacts becomes known. In completing the files, we may consider that we are merely breaking ground for further important work. These epidemiological cards are the crux of the whole situation, and the solid foundation for the necessary follow-up work destined to eradicate tuberculosis. We do not propose, however, to remain idle until the files are completed. As soon as a card is filled we do follow-up work on that particular case, but the epidemiological problem of the whole state necessarily depends upon the entire file system.

In addition, whenever a new case is reported through any one of the various channels, a similar card will be completed and added to the file. In this way the system will remain up-to-date and effective.

The economic status of the individual is very important. If not handled correctly, it may be the cause of failure. When the individual is financially able to pay, the family physician usually encounters no difficulty in getting him and his family to the office for Mantoux test or X-rays. When the individual is under county or federal relief, then the county or federal authorities are usually willing to consent to the necessary expenditures as advised by the family physician. It is the individual who is neither on relief nor, for one reason or another, able to pay for the expense, wherein we may meet difficulties. The Red Cross, Christmas Seal Agencies, and other Volunteer Agencies have funds available for this group of people. In many instances the individual and his family is unable to obtain funds for the examination of himself and his contacts. For this reason the State Board of Control has set aside a small fund to be used for the taking of such X-rays as are necessary for the completion of the files whenever the epidemiologist recommends it. The State Sanatorium then replaces the film with a new one and forwards it to the doctor together with one dollar in addition. The institution, however, makes the condition that the X-ray plate taken must be readable and in good condition. In all cases the State Sanatorium furnishes the family physician with fresh 1-1000 Old Tuberculin for the Mantoux testing of contacts.

The family physician must realize that the amount given to him by various agencies does not represent ample compensation for his professional services, but is merely the cash outlay for such expenditures. It is up to the doctor to contribute his time considering the fact that he is doing pioneer work and helping to set up a permanent structure of which he is an integral part.

We wish above all things to see that this set-up retains its professional unity. It is necessary for the State Sanatorium and the respective physicians in the State to do their part until the ground work has been laid. In the State of Minnesota the family physicians have given us their whole-hearted support and have an unusual understanding of the problems before us. This, we believe, is due to the splendid work done by the various health agencies, such as the Minnesota Public Health Association, State Board of Health, Lymanhurst School in Minneapolis, and the Minnesota State Sanatorium in obtaining the aid of the family physician. In other words, the advances and results already seen in the program have been due to the fact that all the various organizations and individuals interested in the eradication of tuberculosis have worked together to this end.

Whenever the families refuse to be treated or refuse to give information, their names are turned in to the State Board of Health on regular forms. Tuberculosis is the only communicable disease in Minnesota reportable by statute. It is then a problem of the State Board of Health, which has the power and authority to obtain such information and to insist upon examinations.

The State Sanatorium has no policing authority so it must depend upon the education as well as the co-operation of the physicians and the laity for its effectiveness.

The control of the disease must, of necessity, extend to the Sanatorium. There, hospital technique is applied for the purpose of isolating the positive sputum cases. Upon admission of the case, the individual is isolated under observation while the laboratory and clinical examinations are made. Then he is classified according to his X-ray and sputum report and transferred to the appropriate station. We regard all cases with excavations as potentially positive, even though their sputum is negative at the time. Accordingly

the negative sputum cases are not intermingled with the positive ones. In that way we attempt to avoid cross-infections and force upon the patient the principle that all positive sputum cases are dangerous to contacts, whether they have tuberculosis or not. The nurses and employees, however, are instructed to regard all cases as potentially positive and are equipped with the general facilities of a contagious ward employee.

Briefly, the regulations are the same as those of a contagious ward except that instead of each room being isolated by itself, the positive and negative groups are isolated according to their status. All nurses and orderlies wear gowns and apply the face mask when working around patients. They are also instructed to wash their hands after the care of patients or the handling of contaminated articles. We consider any part of the ward, or any article, contaminated whenever it is so situated as to come in contact with the patient or his infected discharge. The patients use tissue napkins instead of gauze, which they deposit in a paper bag. This is easily collected and burned.

Two dining rooms are maintained for ambulatory patients. One for the positive and the other for the negative groups. In the dining room maintained for the negative sputum cases there is also a portion set aside for employees. The patients use different colored dishes from those used by the employees. These are washed and sterilized in separate groups. There is also another dish washing and sterilization outfit maintained for dishes from positive sputum cases.

The effect upon the patient has proved to be wholesome and co-operative. We do not in any way police the patients nor operate any detention wards. The patients, of their own accord, are educated to these principles and not only abide by the regulations but also see that others do the same. During the summer of 1933, Dr. H. W. Hill, of the British Columbia Board of Health, visited our institution. He interviewed a group of patients in order to ascertain their attitude toward hospital technique as employed at the Minnesota State Sanatorium. In the Bulletin of the British Columbia Board of Health, September, 1933, he writes:

"Those interviewed in ward or office or elsewhere showed many various reactions to the questions informally put. The names of the patients were not taken—and in most cases were not even mentioned. Sometimes the patients volunteered their names. The questions related to the patient's length of stay in the Sanatorium, experience in other sanatoria, impressions made by the Sanatorium 'infectious hospital technique,' and what the patient would like to see done differently in these lines. The conversation sometimes wandered afar, but these four points were covered in all.

"One finding was almost universal—a quite assured sort of understanding of the communicability of tuberculosis, and of the technique required to prevent its spread. In general, the younger and the more intelligent the patient, the more this understanding was in evidence; but many of the older patients were very well informed also. In general these patients all appreciated the technique as a protection to the nurses. When asked if they would wish to see this technique to protect their own families on returning home, while still positive, the answer usually was not to the question itself, but took the form of the statement that they did not wish to go home until they were no longer a menace to their home people. This sort of reply indicated that an education in sound tuberculosis prevention has been acquired, doubtless emphasized and made concrete by the infectious technique daily before them. . . . Although the above represents opinions of no scientific weight, it does indicate that most of the patients here do not feel burdened by or resentful toward the technique used —that a majority appreciate it; and that a few, although granting that the principles are correct, do feel a sort of resentment against it—if they themselves are in the positive class. This is, of course, very human, indeed."

We wish to call your attention to the fact that the Minnesota State Sanatorium has no lectures or informal talks given to the patients as a group. The patient learns the major points and purposes of hospital technique through its application. This, we believe, is more lasting in effect. Upon discharge the patient applies these regulations at home for the safety of his family. This alone makes his stay at the sanatorium of permanent benefit.

Throughout our program, the sputum is regarded as the yardstick of contagion. In order that it may be an accurate one, we must be sure that it is examined thoroughly. If negative reports are returned on routine examinations, concentration tests and even guinea pig inoculations should be employed. At this sanatorium, we use the hydorcarbon flotation test for corraboration. In a recent survey of 99 negative sputa on routine examinations, 33.3% were found to be positive by the flotation test. It is therefore apparent that the sputum examination must be improved so as

to become a more selective screen. The ultimate success of our program depends upon adequate and careful examinations. At the present time laboratories throughout this country are investigating methods of sputum analysis in order to obtain the one of highest accuracy. The guinea pig inoculation test is satisfactory but the time and expenditure involved make it disadvantageous for routine use.

It is interesting to note that of 465 cases discharged from the Minnesota State Sanatorium since October 1, 1931, excluding deaths and readmitted discharges, 364 cases showed either positive or negative on history and remained persistently so throughout their stay at the Sanatorium. In 101 cases the positive and negative sputum reports alternated. Even so, in 52 cases there were no positive reports after the first negative appeared. In 21 out of these 52, a positive sputum appeared in the history only and was persistently negative while at the sanatorium. Therefore, only 49 discharged cases out of 465, no more than 10.5%, showed any irregularity in reports during the life of their disease. The point that is apparent is namely that once a patient shows a tendency to become either negative or positive, in 89.5% of the cases, he stays persistently so: especially is this true when he is negative. Therefore, when a patient is discharged, we can, by looking over his past history, tell what course his sputum is apt to pursue after discharge. Of course in cases of exacerbation or reinfection, the negative sputum may become positive.

The Minnesota State Sanatorium never gives its consent to a patient leaving the sanatorium if his sputum is positive. If the patient does leave, he goes against medical advice. The State Board of Health alone has the authority to require that all people suffering from a communicable disease, and this includes tuberculosis, be cared for in such a manner that they will not endanger the public; but once they are admitted to the Sanatorium, we have no custodial authority to detain them if they wish to leave. It is evident that until the State Board of Health extends its authority in returning patients who are a menace to the public, the epidemiological problem will be complicated. It is these individuals who are the dangerous infectors. They do not care who they infect, whether it be their loved ones or their neighbors.

The State Sanatorium has always worked with the family physician and is more than willing to return such patients as are non-contagious to their family physicians for after-care, providing the family physicians are prepared to do so effectively.

The family physician must, however, be in entire control not only of the patient, but also of his family. The after-care extends to the patient's contacts as well as to himself and continues until after the patient has become rehabilitated.

Summary

The set-up as practiced at the Minnesota State Sanatorium is so constructed as to isolate the center case at the Sanatorium until his disease becomes non-infectious; then, to discharge, or in reality to transfer, him back to his family physician for after-care and supervision.

Only positive sputum cases are considered acceptable for admission. Those that are negative are retained only until their true status is determined and they are then returned to their family physician as soon as practicable. In the meantime, investigations of the patient's household and community contacts are made, and the information written on regular forms. These forms are then placed in a central file at the State Sanatorium. This file then forms the solid foundation upon which future follow-up is based. The knowledge of the exact status of every contact and open case will enable the family physician and the epidemiologist to keep the disease under control. The follow-up will permit the epidemiologist, through the family physician, to keep a constant vigil over the new cases, open cases, sanatorium discharge cases, and contacts.

After the completion of such a case, all the information is at hand, the center case treated, the contacts diagnosed, and the household purged of the disease. When the patient returns, he goes back to a clean home and he himself is free from the bacillus. The sanatorium has become an integral part of the epidemiological set-up and prepares the patient for his return. The patient has been educated to the principles and purposes of hospital technique, his case had become non-infectious, and he has ceased to be a public or family health menace.

Thus the cycle is broken, the family healthier, the source of infection removed, and the community safer.

Rocky Mountain Spotted Fever*

V. A. Mokler, M.D.
Wentworth, S. D.

(Tick Fever, Mountain Typhus, Mountain Fever, Trail Fever)

FIRST written accounts of this disease were in 1896 and applied to Montana and Idaho. The present name of the disease was given in 1903 and the theory of Tick transmission was definitely agreed at that time although observers had been advancing this theory several years before. But long before either of these dates there is no doubt that Spotted Fever was prevalent in the Rocky Mountain region because those men who have made a study of this disease and who have sought more information as to its origin and distribution have learned from the Indians and from the old time prospectors that in the 80's and possibly before that there were cases similar in nature and which had been called Trail Typhus, Trail Fever or Mountain Fever. And while it is more than possible that the life of the emigrant pre-disposed to Typhus Fever, it is hardly reasonable to think that Typhus would only be present in that country which was the habitat of the Rocky Mountain Wood Tick and not manifest itself prior to reaching this point and at further points along the trail. This disease has been designated with the prefix Rocky Mountain because of the geographical location and it has only been in recent years that cases have been reported far beyond the border of the Rocky Mountain States, namely Pennsylvania, Maryland, Virginia and Tennessee.

It may seem somewhat out of place to attempt to discuss Rocky Mountain Spotted Fever here because, from what I can learn, there has been no cases originated in this locality and no doubt there are several present who have never seen a case of Spotted Fever. But had one stated one year ago that we would be looking for Amoebic Dysenterry in this locality we would have thought this rather far fetched and I believe we have more reason to be on the lookout for Spotted Fever and I venture to predict that within the next year or two we will some of us see one or more cases and when these occur there are bound to be more. The etiology of this disease will show my reasons for making this statement. In the past, very few authors of Medical Literature have given this disease more than passing mention but the second edition of Cecil published in 1930 devotes more space to it than any other book that I have seen. But in spite of the fact that this disease is so little known there has been a great deal of research work done for many years and there is located at Hamilton, Montana, a laboratory under the jurisdiction of the United States Public Health Service which is making advances toward the control of this disease and they have already produced a prophylactic vaccine which seems to show wonderful results.

*Presented before the Third District Medical Society, Brookings, S. D., September 20, 1934.

Definition

Rocky Mountain Spotted Fever is an acute, specific, non-contagious, tick-borne disease, endemic in the Northwestern part of the United States. Clinically it closely resembles Typhus Fever and is characterized by an onset with chill, continued fever, severe headache, pains in the bones and muscles, and a macular and sometimes maculo-papular eruption which appears about the third day of the fever, first on the wrists, ankles and back and then over the entire body.

Etiology

Rocky Mountain Fever is transmitted to man through the bite of the Tick Dermacentor. Venustus or Andersoni which is the common wood tick of the Rocky Mountain region. The host for this parasite depends largely upon what animal is available but the principal hosts of the adult tick are horses, cattle and sheep; and of the larvae and nymphae are the Columbian Ground squirrel, chipmunk and pine squirrel. The host of the adult tick, especially the sheep, is my reason for previously predicting that Rocky Mountain Spotted Fever will appear in this immediate vicinity. Each year some farmers are shipping in lambs from Montana and these are put in the feed lots for the purpose of fattening. But all sheep are not marketed each year and there are small bands being kept on many farms. I am not advocating that it be otherwise, I merely want to show the presence of the host of the tick and my reasons for some of my statements. It is recognized that there is a rather

definite season for ticks; it begins early in the spring, generally about the 15 of March and continues until about July 1. About the latter date the adult tick disappears but the larvae are found feeding through the summer months. They then drop off the host and go into hibernation to come up for feeding the next spring. The normal cycle of the tick is, therefore, two years and it immediately comes to mind that those lambs shipped in here are acting as hosts for this parasite and when man accidently comes in contact with one of these infected ticks and is bitten we will have our first case of Spotted Fever. I say accidently because Spotted Fever is not primarily a disease of man; it is a disease of wild animals and would go on in nature if man were to be eliminated entirely from the picture. But because of occupation man naturally comes in contact with the tick and these contacts do depend greatly on location, occupation, etc. Since the early 1900's cases have been reported in California, Nevada, Idaho, Oregon, Utah, Colorado, Wyoming, Montana, Washington, South Dakota, North Dakota, New Mexico and Arizona, and in the past two years there were a few cases reported in Pennsylvania, Maryland, Virgina and Tennessee. Man possesses but little if any immunity against this disease. The incidence among males is greater by virture of exposure due to occupation but none are immune, although children withstand the infection better than adults while in the adult past middle age it shows a high mortality rate unless vaccinated.

Incubation Period

This varies, the average in man being from four to seven days.

Symptoms

No lesion appears at the site of the tick bite, nor is there any enlargement or tenderness of the regional lymph glands. The patient usually experiences a prodromal stage of one or two days characterized by listlessness, vague aches and pains, loss of appetite, general malaise and perhaps a slight temperature. This is followed by a chill and a rapid rise of temperature to 104 or 105 where it remains for ten or fifteen days, sometimes with morning remissions and falls by lysis usually reaching normal in the third week. Severe headaches and backache are always present and may resemble that of Smallpox. The skin is sensitive to the touch and there is present, insomnia and extreme restlessness and in many cases a delerium with the rise in temperature. The skin is flushed and at times dusky, the eyes are reddened and sore. About the third or fourth day a reddish macular rash appears on the wrists and ankles and rapidly spreads over the entire body. In most cases the eruption goes on to the petechial stage and becomes dark purplish and confluent, but in some cases of the more severe type early death may occur before a pronounced stage is reached.

The condition of the patient may be determined largely by the pulse, it being low at first in proportion to the temperature but there is a gradual loss of strength and volume. When the rate remains below 120 per minute the patient's condition may be considered good but a rapid rise to 130 or 140 is a bad prognostic sign.

Differential Diagnosis

The disease may be confused with severe measles, cerebro-spinal meningitis or even smallpox and before the eruption appears, may resemble a severe case of influenza. However its appearance in the spring of the year and with a history of tick bite and its own peculiar eruption should make the diagnosis easy to determine.

Treatment

Probably the first and most important measure under the head of treatment should be that of prevention. There is made in Montana a prophylactic vaccine which has been used extensively for the past few years with encouraging results. There seems to be no harmful effects and while it is not claimed to be a 100 per cent preventive measure, it shortens the period of illness, lessens the severity of the disease and so far as I can learn there have been no reports of death in any vaccinated person. This vaccination must be given every year because in some cases the immunity does not last over one season.

Another preventive measure which can be easily used by anyone is the manner of clothes worn. Anyone liable to tick bite should wear high top boots with trousers tucked into the boots. The protection of the upper part of the body is of little importance because most of the ticks will drop off before crawling above the waist although they are sometimes found embedded in the upper regions particularly the axilla.

A third measure of some importance is the removal of the tick after it has become fixed. It has been suggested (and often used) that turpentine, benzine, iodine or denatured alcohol applied to the biting tick will cause it to let go. It is better to take hold of the tick with the fingers and pull it off slowly with a firm straight pull without jerking. After removing the tick it should be examined to see if the three separate shafts of the mouth parts are still on the tick.

If parts are left in the flesh the wound may be slow in healing and may even lead to a serious complication. If it is found that a part has been left in the wound a minute piece of flesh sufficient to include the part should be removed either by fine scissors or a very sharp knife. Many of us have used this latter method of removing the tick feeling that then we were sure of complete removal. After this procedure the wound is cauterized either with a silver nitrate pencil or carbolic acid.

The treatment of the disease itself is very unsatisfactory. There are many lines of treatment advocated by different men and as a rule when this is the case none of them are what we hope for. Dr. A. B. Tonkin, of Wyoming, now deceased, stated to a meeting of County Health Officers two years ago that: "He had found no satisfactory treatment, that one year he would feel that he had arrived at a good line of treatment and had gotten good results and that the very next year under the same kind of treatment his death rate was high and the treatment unsatisfactory." Dr. Tonkin has done as much along the line of tick fever treatment as any man in Wyoming or probably any other Western State and the results obtained by him were similar to that of others. Some of us have used the prophylactic vaccine early in the disease and felt we had obtained some good results but its use is not advocated by the U. S. Public Health Service.

General Treatment

On first seeing the patient he should immediately be put to bed in a quiet room and not removed. Digitalis therapy is started early in the disease because of the failure of the heart muscle which sometimes occurs early. Hypnotics and narcotics may be necessary for the delerium. A good mouth wash should be used because the mouth, tongue and lips become very dry and crusted if neglected. Cold or tepid sponges may be given to control the temperature, some men advocate the cold baths that have been used in Typhoid Fever. Many men use the intravenous injection of quinine while others use the Areenicals and claim favorable results. However, the first named, Quinine Hydrochloride in seven and one-half grain doses has seemed to be rather effective in the control of temperature and this was the drug of choice in that part of Wyoming, where I had been located. Liquids should be given freely and the diet should be light but sustaining. An enema may be used each morning if needed. Antipyretics are contraindicated because of the weakened heart muscle. Aside from this different physicians may have some slightly different treatment but on the whole this will cover that used by most men. It may be that this year or even next someone may find a better treatment, but from the deaths that have occurred this year already, it seems that it has not yet been found.

Now for just a few figures showing the incidence of the disease and the mortality rate. These figures are for Wyoming and I think will conform closely to that of the rest of the states where reports are fairly complete.

In Wyoming from 1922 to 1930 inclusive there were 1,122 cases of Spotted Fever resulting in 171 deaths or a percentage of 15.2. In 1931 there were 26 cases with four deaths; 1932, 82 cases, 15 deaths, and in 1933, 120 cases and 14 deaths.

The
JOURNAL LANCET

Represents the Medical Profession of
MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA

The Official Journal of the

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South Dakota State Medical Association
Montana State Medical Association
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LANCET PUBLISHING CO., *Publishers*
84 South Tenth Street, Minneapolis, Minnesota

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MINNEAPOLIS, MINN., DECEMBER 15, 1934

TUBERCULOSIS CONTROL IN WASHINGTON

Dr. Nelson's paper indicates the ideal method of beginning an attack on tuberculosis in any community or political division. First, the Washington State Medical Association has appointed a Tuberculosis Committee of which Dr. Nelson is chairman, showing the interest of the medical profession of the state in the control of this disease. Second, the State Medical Committee after it had secured the support and co-operation of the local medical society and the State Tuberculosis Association decided to put on a demonstration. The president of a state normal school was approached, who in turn presented the project to the student body, whose health service organization provided a part of the funds for the demonstration. The medical profession was convinced of the value of the tuberculin test, inasmuch as only 27.5 per cent of the students, with an average age of approximately twenty years, reacted positively. They were further convinced of the value of the X-ray films for the positive reactors, since it brought to light definite evidence of pathology.

The demonstration did not end here; the tuberculin test and the X-ray film were simply used as screens and physical examination was recommended for all the positive reactors. This makes the examination complete and does not leave the student or the profession with the thought that any single phase of an examination is adequate. It was the intention of Dr. Nelson's Committee to demonstrate to the medical profession of the State of Washington the new methods of diagnosing tuberculosis and the proper procedures, once any indication of tuberculosis is found, with the hope that every member of the profession, regardless of the phase of medicine in which he is especially interested, will seek out tuberculosis among all the members of his clientele, and will equip himself with the latest information on the subject, in order that he may be an effective educator in the control of this disease in his community.

It is most encouraging to know that a number of State Medical Associations have recently appointed or are planning to appoint special Tuberculosis Committees. A great deal of tuberculosis work in the past has been done in a rather haphazard manner because of lack of proper direction. With this somewhat new movement on the part of medical associations, we can look forward to medical direction for all tuberculosis activities. This does not mean, of course, that there is not ample room for non-medical workers. They have always been of great help and will continue to be so, but it will mean that all contemplated projects and programs will be carefully thought out and properly balanced before they are undertaken. The program which

Dr. Nelson's Committee has outlined, and the work done to date is ideal. We only wish that every physician in America had an opportunity to see and study the tuberculosis activities of the Washington State Medical Association.

J. A. M.

DOES LIFE BEGIN AT FORTY?

Life Begins at Forty is the astounding title of a book that is enjoying much popular comment. Any statement that seems incredible is naturally startling, and for that reason alone it is often used to command attention. There is much that may be said in favor of middle age of course, providing that one enjoys good health, but to say that life begins then, even though the expression is used in a figurative sence, should not be allowed to go unchallenged.

Osler made the statement thirty years ago that with rare exception creative thought and true inventions were not possible for the human mind after forty.

Now let us see what it means to be forty. Childhood diseases are a thing of the past, measles like love, you only have once. School days and apprenticeship in preparation for life's work may or may not have been a drudgery but they too lie in the past. Shakespeare refers to "my salad days when I was green in judgment" and surely at forty good judgment should have arrived. Victor Hugo said that every normal person is a radical at twenty and a conservative at sixty. With experience comes judgment and wisdom, there's no question about that; and at forty there should be a fair balance between the rashness of youth and the hesitation of old age. Then, of course, you have lived forty years and that's something. The longer you live, the longer you may be expected to live. That is to say, a man at twenty has an expectancy of thirty-eight years, which would bring his span of life to fifty-eight; while the man of forty has an expectancy of only twenty-eight years, but that gives him the greater total, sixty-eight. Now then, how about the much vaunted statement that scientific knowledge and enlightenment has pushed the life line back several years? This is also a statement that calls for qualification. To be sure, the span of life has been lengthened when computed on an average basis, but the more favorable figures are due to a greatly reduced mortality among infants. At forty we begin to encounter the diseases that are not diminishing but increasing in the toll they take. Diseases due to tissue change and wear and tear, such as cancer, diabetes, heart and Bright's disease are on the increase, and they are the outstanding enemies of life at this age.

Osler used to say "Happy is the man who finds albumin in his urine at forty; not because he has albumin but because he has found it and will take care of himself." Life does not begin at forty, neither does it end at forty. It would be much better to say that life begins to end at forty and watchfulness then becomes the watchword of the prudent.

A. E. H.

SPLINT 'EM WHERE THEY LIGHT

Through the efforts of the Minneapolis Regional Fracture Committee and the Minneapolis Surgical Society, co-operating with the Committee on the Treatment of Fractures of the American College of Surgeons, the nine private ambulances of the two private ambulance companies in Minneapolis are now equipped with the approved splints for transportation of fractures of the upper and lower extremities.

The Thomas-Murray hinged splint for transportation of upper extremity fractures and the Keller-Blake hinged half-ring splint for transportation of fractures of the leg and thigh bones are carried on all private ambulances and will be applied by the ambulance attendants under the direction of the attending physician, if present.

The splints will be left on the patient until they are removed by the attending physician at the hospital after the X-ray study has been made. The hospitals will carry an extra supply of these approved and standardized splints for exchanging with the private ambulances as the splinted patients are brought in.

The private ambulance companies are arranging to demonstrate this method of splinting fractures and these splints at all hospital staff meetings so that all members may see just how they are equipped to "Splint 'em where they light."

R. C. W.

Proceedings of Minnesota Academy of Medicine

Meeting of October 10, 1934.

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday, October 10, 1934. The President, Dr. Archa Wilcox, in the chair. The meeting was called to order at 8 p. m.

There were 67 members and three visitors present.

Minutes of the May meeting were read and approved.

The scientific program followed.

Gastritis—a Phenomenon of Pyloric Obstruction, and its Relation to Duodenal Ulcer

by

Waltman Walters, M.D.

and

Gerald T. Church, M.D.

Rochester

Dr. Walters, candidate for Associate Membership, read his Inaugural Thesis on the above subject. Lantern slides shown. (Published separately).

Summary

In microscopic examination of specimens removed from stomachs resected during the course of operations for duodenal ulcer, associated gastritis was found in but few instances. In studies made of obstructing gastric lesions, it appeared that gastritis occurred in association with pyloric obstruction in a high percentage of cases, and was absent when pyloric obstruction was not present. To confirm this clinical impression, a group of cases in which there were obstructing carcinomas of the stomach was studied, and microscopic evidence of gastritis was found in 92 per cent of the cases. A study was made of a control group of patients who had carcinoma without obstruction, who were of similar age and distribution by sex, and whose symptoms were of similar duration. Gastritis was absent in 82 per cent of cases. Studies are in progress at the present time, to determine whether gastritis can be caused experimentally, by producing various degrees of pyloric obstruction with fascial bands.

Discussion

Dr. F. C. Rodda (Minneapolis): I would like to ask Dr. Walters what we might anticipate in a case of congenital pyloric stenosis? Is there any evidence that we might have an associated gastritis in these cases?

Dr. J. A. Johnson (Minneapolis): Dr. Walters certainly should be complimented on his presentation. Some very interesting observations have been brought out. I have been somewhat hesitant in doing the extensive resections advocated by some surgeons, both here and abroad. Dr. Walters has clearly demonstrated that gastritis is confined almost entirely to cases that are obstructed. If that is true, then we should accomplish about the same result with drainage and neutralization of a gastroenterostomy as they do with wide resections. There are undoubtedly many things that should be taken into consideration as causative factors in the production of gastritis. There is a great difference between American and Europeans in the mode of living, the type of food and drink, and the customs of eating. If one observes the mouths in most Europeans, one finds that they are almost universally filthy as compared to mouths of Americans. If infection from the mouth is constantly draining into an obstructed stomach, it is not strange that many should develop gastritis. For many years in this country there has been constant propaganda for clean mouths. This in itself may have served to limit the number of cases of gastritis.

Dr. Irvine McQuarrie (U. of M.): This may be a little aside, but I recall as a youngster hearing of a man with some chronic stomach disorder, who had on several occasions, had his breath get on fire. This summer my attention was called to a paper in the London *Lancet*, reporting a genuine case of this type and citing others in the literature. Apparently what happens in such cases is that methane and hydrogen gases, which have been generated in the partially obstructed viscus, are ignited when they are eructated at the same time that a lighted match is being applied to a cigar or pipe held in the patient's mouth. I have wondered how common that experience is, and if Dr. Walters has encountered any such cases.

Dr. A. A. Zierold (Minneapolis): I have been much interested in hearing Dr. Walter's paper this evening, particularly in hearing his report of the material in European clinics. While at Schmieden's Clinic, I had an opportunity of going over a good deal of his material, and, although the evidence of gastritis appeared to be definite in the gross, I was much less impressed with the microscopic sections. I think most peo-

ple who have seen Finsterer's material have been impressed more by the extensity of the operation than by the intensity of the gastritis present. It has been interesting to hear Dr. Walter's reconciliation of the situation by his observation of the development of gastritis, following pyloric obstruction. While we have much less material, I too have been struck by the frequent occurrence of gastritis in the Surgical Clinic at the Minneapolis General Hospital, and particularly in obstructing carcinoma. We have identified gastritis by the use of the gastroscope and also at operation. Another thing we have noticed is that very definite and demonstrable gastritis often occurs in those who have come for secondary gastric resection.

Dr. George Fahr (U. of M.): Dr. Zierold has taken some of the words out of my mouth; namely that part of his discussion in which he mentioned the gastritis one sees following gastroenterostomy. We see this in cases coming back to the hospital, who have had a duodenal ulcer and a competently-performed gastroenterostomy; they come back with distress symptoms and when one looks through the gastroscope one sees two of the different types of gastritis that have been described by the gastroscopists, and, after putting these patients on what amounts to a Sippy regime, the condition clears up in some cases; not all cases, however. I think there is no question that there often is an abnormal appearance in the gastric mucosa following gastroenterostomy.

Dr. A. C. Strachauer (Minneapolis): In regard to the incidence of ulcer, it is my opinion that the percentage of occurrence is decreasing. In my own practice, I certainly see fewer cases of surgical ulcer and fewer cases of the complications of ulcer; that is, perforation and hemorrhage. Is this decrease due, perhaps, to better oral and dental hygiene? Has the widespread removal of the tonsil had an effect?

My surgical work is carried on in three hospitals, so that I have opportunity to see the surgical cases posted for operation, and it is certainly quite the exception to see cases of ulcer posted for operation in our Minneapolis hospitals. The present economic condition is, I am sure, not entirely responsible for the change. In a period of 25 years of observation there has been a definite decrease and nearly complete disappearance of certain surgical lesions, that were common in the early years of my practice, *i.e.*, tubercular glands of the neck, tubercular salpingitis, and tubercular peritonitis have practically disappeared. Also, the incidence of goitre has greatly decreased.

Dr. Russell Morse (by invitation) (Minneapolis): From the discussion this evening, the question of gastritis seems to be a question of several problems: (1) what constitutes normal histology of the stomach; (2) the question of habitat; (3) the question of oral hygiene.

I believe that the question of histology is the more important. What constitutes normal gastric mucosa? In 1928 Faber and Lange set up a fairly strict standard of what should be considered the normal histology of the gastric mucosa. They described the tubular gastric glands as normally being closely-packed together and separated from each other and from the muscularis mucosa by a minimal amount of interstitial tissue, consisting of small blood and lymphatic vessels, a small amount of fine connective tissue, and very few wandering cells. The surface epithelium is of the mucous type of columnar cell, and this epithelium also lines the fovea. The interfovealar spaces are filled with a very fine reticular tissue with very few wandering cells. From our studies of surgical material, we are in agreement with these findings of Faber and Lange. If this standard is accepted as normal, then the evidence of inflammation of the gastric mucosa is a very common finding. The inflammatory changes which we have observed in the gastric mucosa are congestion, edema, and infiltration of the interstitial tissues by various types of leucocytes and wandering cells, and the formation of lymphoid follicles in the base of the mucosa. In the presence of these inflammatory changes there usually eventually ensues an atrophy and gradual disappearance of the specific glands of the gastric mucosa.

Dr. Walters (in closing): I wish to thank you all for your discussions. I was very anxious to hear your opinions of this problem. Gastritis is a very important condition, and its relationship to duodenal ulcer is worth continued study by all interested in gastroenterology. If various observers are willing to discuss their studies, we are bound to arrive at some conclusions as to the part it plays in cases of duodenal ulcer. (And while I would like very much to discuss this further, I think perhaps we had better postpone this because I don't want to infringe on Dr. Sweitzer's time.) I do think that gastroscopic studies will advance our knowledge of this lesion.

MULTIPLE AREAS OF CUTANEOUS GANGRENE FOLLOWING SCARLET FEVER

by

S. E. Sweitzer, M.D.
Minneapolis

Dr. Sweitzer read a paper on the above subject and showed lantern slides of the case.

Discussion

Dr Carl Laymon (Minneapolis) (by invitation): I think this case serves to emphasize the fact that, although suppurative adenitis is a common complication of scarlet fever, gangrene of the overlying skin is very infrequent. This type of gangrene should be differentiated from ecthyma gangrenosa usually seen following pustular eruptions such as chickenpox and smallpox.

Dr. Paul O'Leary (Rochester): It is interesting to note that gangrenous ulcerations of the type Dr. Sweitzer described are encountered following systemic diseases of streptococcal origin; they occasionally appear following erysipelas or in association with scarlet fever. I have been particularly interested in gangrenous ulcerations of this type because of a group of cases which were reported from my service several years ago, in each of which the skin condition was a complication of ulcerative colitis. Although the pathology was essentially that of an ulcerative gangrene, the course of the disease in these patients was more chronic, lasting over a period of years, in contrast to the ulcerations due to acute streptococcal infection, which run a shorter course. Although some of our cases presented the Bargen type of colitis, it was not a constant finding. Cultures from the lesions in this group elicited both staphylococci and streptococci. Stookey and a group of co-workers recently reported a similar type of ulceration following erysipelas in which staphylococci were recovered repeatedly in pure culture. In other words, the studies would indicate that both streptococci and staphylococci may produce gangrenous ulcerations in the skin, and the factor which allows these organisms to produce these unusual cutaneous pictures is probably a change in the patient's defensive mechanism as a result of the systemic disease he has just gone through. Accordingly, it has been our experience in the treatment of these patients, that efforts directed toward stimulating the defensive mechanism by some foreign protein therapy have been more successful than measures directed toward the local care of the ulcerations.

Dr. John Butler (Minneapolis): Hutchinson first described this very rare condition, naming it varicella gangrenosa, as he assumed it was always in sequence to varicella or vaccinia. Crocker, and various others, observed similar gangrenous lesions following other diseases, such as scarlatina, variola, malaria, typhoid fever, measles and pneumonia. In multiple gangrene of the skin the lesions are usually numerous. I would like to ask Dr. Sweitzer if he considers the lesions in his case due to embolism, thrombosis, or external inoculation of the skin?

Dr. Archia Wilcox (Minneapolis): Dr. Sweitzer's paper recalled to my mind four cases of gangrene of the skin complicating typhoid fever, which occurred in Philadelphia, during an epidemic in 1900, at a time when I was an interne in the German Hospital. I have photographs of these cases and wish to present them at this time. Just prior to the Russian-Japanese War, the Cramp Shipyard, of Philadelphia, had under construction two battleships for the Russian Navy. A medical corps and full quota of seamen were sent from Russia to man these two vessels. The medical officers manning the boats were of high intelligence, charming socially, and I was much impressed at the time of their linguistic ability. However, the seamen were selected from various provinces in Russia and on account of the various dialects, they appeared to have difficulty in conversing. In general, they presented a low type of intelligence, and, not appreciating the principles of sanitation or the niceties of life, they jumped into the Delaware River for a bath. As a result of this activity about sixty cases of typhoid fever developed in the crew and they were brought to the German Hospital. Among these sixty cases, we had these four cases of rather extensive gangrene of the skin complicating the typhoid fever, and I thought that the dermatologists would be glad to comment on the etiology and pathology of these lesions. They are, undoubtedly, a rare condition, but to me they are interesting as an historical event in my early career.

The meeting adjourned.

R. T. La Vake, M.D.,
Secretary.

NEWS ITEMS

Contracts have been awarded for the erection of a new Nurses Home at Mayville, N. D.

Dr. T. E. McGauvran, Sherwood, is now located at Velva, N. D., where he will continue his practice of medicine.

Dr. R. D. Devereaux, Sioux City, Iowa, has moved to Vermilion, S. D., and opened offices for general practice.

Dr. W. J. Barnes, formerly located at Rolla, has moved to Fargo, N. D., and will continue in general practice.

Dr. Martin G. Flom has purchased the practice and equipment of the estate of the late Dr. G. O. Fortney, Zumbrota, Minn.

Dr. Edwin T. has become associated with his father, Dr. D. P. Maitland, Jackson, Minn., in general practice of medicine.

Two St. Paul physicians were sentenced to a year at Leavenworth penitentiary for sale of narocotics to peddlers and addicts.

Dr. Malcolm Martin, a graduate of the North Dakota School of Medicine, died at New Glasgow, N. D., recently after a brief illness.

The Yellowstone Valley Medical Society had Dr. George Behrs, Salem, Ore., as their principal speaker at their November meeting.

Dr. J. T. Wingate, who has been in active practice at Platte, S. D., for over 20 years, died suddenly from heart failure on November 17.

Dr. E. M. Hammes, St. Paul, was the principal speaker at the November meeting of the members of the Grand Forks Medical Society.

Dr. J. H. Adair, one of the pioneer physicians of South Dakota, passed away last month after an illness of over a year, at the advanced age of 80 years.

Dr. Arthur C. Dean, formerly of Hot Springs, S. D., died last month at East St. Louis, Ills. Dr. Dean was buried at Grand Forks, N. D., his birthplace.

Dr. Phileo Jones, a former well known physician of Red Wing, Minn., died recently at his home in Portland, Ore., where he had resided for several years.

The jury brought in a unanimous verdict of not quilty for Dr. Eubert V. Simons, Spring Valley, Minn., in the $20,000 suit that was brought against him.

Dr. A. H. Hall, San Haven, N. D., presented an interesting paper on "Modern Trend In Tuberculosis" at the November meeting of the Northwestern Medical Society, at Minot.

Dr. W. E. Ground, Superior, Wis., will spend three months in Europe visiting many hospitals in the study of cancer. This will be the fourth trip that the doctor has made for this purpose.

Dr. Arthur K. Kilbourne, 76 years old, superintendent of the Rochester State Hospital for 45 years, died last months. Dr. Kilbourne was a former president of the American Psychiatric Association.

Dr. Henry M. Davis, former Minneapolis physician, died at his home in Los Angeles, recently. Dr. Davis practiced medicine in Minneapolis for more than 20 years, maintaining offices in the Myers Arcade.

Dr. Horace Newhart of Minneapolis, Miss Frances Brophy of New York City, and Dr. W. A. O'Brien of St. Paul, were speakers at a public health meeting, sponsored by the Duluth High School last month.

Dr. Morris Fishbein, Chicago, editor of the *Journal of the American Medical Association*, was a guest speaker at the Lions Club, St. Paul, last month. The doctor presented a splendid paper on "Our Changing Times."

Dr. Thomas B. Stutzman, one of the pioneer physicians of Moore, Montana, passed away last month, at the advanced age of 84 years. The doctor had made his home at Denver, for the past two years with one of his daughters.

Drs. Westaby, Baughman and Jordon, were the principal speakers at the last meeting of the members of the Medical Society, at Madison, S. D. After a fine dinner was served, all of the old officers were re-elected for the ensuing year.

The Sixth District Medical Society held a meeting in Bismarck, Nov. 14, with Dr. Frank Heck, of the Mayo Clinic, as guest speaker on the subject of "Clinical Application of Morphological Changes of the Blood in the Diagnosis and Treatment of Disease."

The new officers of the Olmsted-Houston-Fillmore-Dodge County Medical Society, which were recently elected at their annual meeting at Rochester, Minn.: are Dr. A. M. Snell, Rochester, president; Dr. W. B. Grinnell, Preston, vice-president, and Dr. M. C. Piper, Rochester, secretary.

The Minnesota State Medical Association broadcasts weekly at 10:30 o'clock every Tuesday morning over station WCCO, Minneapolis and St. Paul (810 kilocyles or 370.2 meters). The program for the month of December will be as follows: December 18, "Mental Hygiene"; December 25 (Christmas).

Mrs. Ella Graham, forty years of age, Maple Lake, Minn., has been warned by the Minnesota State Board of Medical Examiners to refrain from representing herself to the public as a dermatologist or skin specialist. Mrs. Graham has been traveling about the state taking orders for cosmetics, and an investigation was conducted, where it is claimed she represented herself as a dermatologist and a skin specialist. Mrs. Graham admitted representing the product as having the approval of the Mayo Clinic, which of course, is an unwarranted statement. Mrs. Graham claimed that the manufacturers of the product had stated to her that the cosmetics were approved by the Mayo Clinic. This was denied by the people who manufacture these articles.

BOOK NOTICE

A NEW CLASSIC

The Power to Love, by Edwin W. Hirsch, B.S., M.D.; New York: Alfred A. Knopf; 1934. Second edition, 363 pages; $4.00.

This volume probably will become the American classic in its field. Certainly, it is the finest work on the so-called "art" of sexual relations yet written for the laity. And more satisfying yet, this book is *not* written by a lady specialist in the field of venery; nor is it the work of either a sociologist or a psychologist. Rather, it is a pleasant discovery to find that *The Power to Love* is the labor of a urologist who can be found any day soberly at work in the College of Medicine at the University of Illinois.

Hirsch writes with a Yankee-like hard-headedness. He spends no time at all with such Lawrencian brain-sprees as "the mystic union with the universe" when considering coitus. Mysticism he leaves to Annie Besant and her cult. Instead, he presents a thoroughly-documented inquiry into the entire question of sexual relations, strengthened throughout with the medical background.

Yet, although he himself is a physician, Hirsch draws freely upon psychology. Much of his guidance came from Freud, from Ellis, from Ferenczi, from Adler, from Van de Velde. His theory that most male impotency (barring anatomical deficiencies) is psychical in origin is competently and concisely expounded. And the chapter called "The Art of Sexual Technique," in which psychology and organic response are interlocked, is the finest treatment of an elusive subject that we have seen.

Beautifully printed, as are most Knopf books, *The Power to Love* has a fine bibliography and a selective index. It is a book which should be the physician's first choice in prescribing for patients who come to him with sexual maladjustment not pathological or functional in nature.

CLASSIFIED ADVERTISEMENTS

PHYSICIAN WANTED

Fine location for young M. D. in western Minnesota town of 800 with fine community hospital. Address Box 88, care of this office.

POSITION WANTED

Medical student, forced to leave school to care for dependents, wants office work. Experienced stenographer and dictaphone operator. Address Box 82, care of this office.

PHYSICIAN WANTED

Doctor to take over my practice during January and February. Must go to Legislature. Cash salary paid and car furnished. Northwestern North Dakota in small town. Address Box 87, care of this office.

PHYSICIAN WANTED

to share suite of offices now occupied by established physician and dentist. Individual treatment room and laboratory. Located in new medical building in fine business and residential district. Address Box 76, care of this office.

PHYSICIAN WANTED

Location in best part of Southern Minnesota. Modern, up-to-date office, in town of 1,200 population. Equipment optional; also residence if desired. Population mixed, Norwegian predominating. Competition "just right." Address Box 83, care of this office.

POSITION WANTED

Physician and surgeon wishes to secure position as mine surgeon or a mine contract practice or industrial practice. Experienced, satisfactory references, married, age 47. Member Montana Medical Association and A. M. A. Address Box 86, care of this office.

PRACTICE FOR SALE

Excellent opportunity to get a well established practice in good farming community. Excellent high school and churches. Physician retiring on account of illness and will sell practice very cheap. Also, physician's home for rent which would be ideal for hospital. Equipment optional. Address Box 84, care of this office.

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